Students and Teaching, 1770–1860

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C A D U C E U S

Students and Teaching in the Clinical Era, 1770–1860

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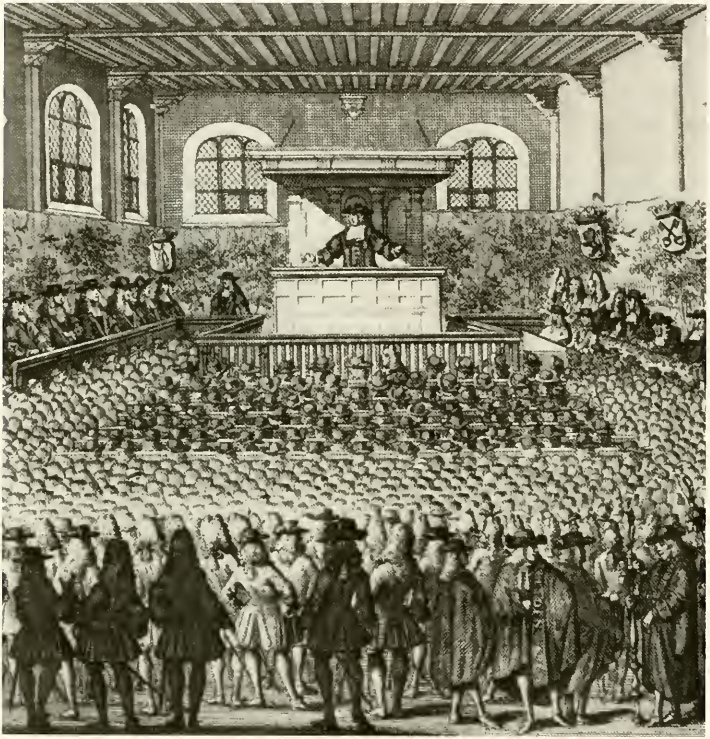

Herman Boerhaave in the Grand Auditorium of Leyden, from his 1715 De Comparando Certo in Physicis

Students and Teaching in the Clinical Era, 1770–1860

Except it be as a lover, no one is more interesting as an object of study than a student.

William Osler

Introduction

The lives of students in all periods of history are difficult to recapture. In the case of medicine, only scattered correspondence, class notes, and occasional diaries can normally be found to give us a first-hand look at what their years of study were like. Sometimes the accounts of teachers, especially if written near the period being studied, or the memoirs of former students can provide some glimpses into the day-by-day experiences of learning medicine. Fortunately, as a number of recent scholars have demonstrated, enough evidence does exist that we can begin to form some impressions of what the study of medicine was like for the young men and women of a century or two ago.

This issue of *Caduceus* is devoted to an effort to identify a few strands in the experience of students in learning medicine and how they learned it in the years from about 1770 to 1860. In many ways, these were formative years in the development of medical education in the Western world. The latter eighteenth century, more than has been realized, was a major watershed for many of the changes to come. New subjects from the scientific revolution of the preceding century were finding their way into the curriculum: a movement toward practical training was gathering momentum in every country; hospital reform, so critical for effective teaching, was spreading through the major cities of Europe; medicine and surgery, divided by centuries of separation, were drawing together; and a number of European states were beginning to set new standards of medical study and practice. The first half of the nineteenth century likewise imbedded into medical teaching a number of features that are still with us—the four-year curriculum, the joining of classroom instruction to practical training in a common course of study, the primacy of the hospital as the site of professional education in medicine, and

by Thomas Neville Bonner
Guest Editor

Seventeenth-century scene of Surgeons' Hall, University of Edinburgh

the role of natural science in explaining the nature and course of human ailments.

Life of the Student

Students and teaching were inevitably affected by the rapid changes. The diversity of pathways to medical study called forth a plethora of guidance and warnings from friends, family, and commercial guidebooks. Students were the target of well-meaning counsel concerning costs, living conditions, personal conduct, choice of schools, and preparatory study. The daily life of the average student, then as now, was marked by endless hours of formal lectures, continual study, frequent examinations, and scurrying from classroom to hospital to dissecting room. Outside a few residential enclaves at schools such as Oxford or Cambridge, every student of medicine was forced to make his or her own arrangements for meals and lodging. Some lived a marginal existence, scrimping on food, staying in the cheapest rooming houses, spending very little if anything on entertainment. For the young student—and most were much younger than today's students, many of them still in their teens—the weight of independence from home and family was often heavy. "In rereading my letter," wrote the fifteen-year-old Johann Steger to his Swiss parents in 1813, "I notice that I did not report on my homesickness.—I am no longer letting it get the upper hand."[1]

Student reaction to medical teaching varied from warm appreciation to sharp criticism. Motivated chiefly by career concerns, they valued most those teachers who prepared them best for the practical trials that lay ahead. Teachers of anatomy and surgery were particularly favored for their directness and practicality. Students often criticized the way in which medical studies were carried out. There was in many countries as yet no fixed order of medical studies, and students encountered uncertainty and conflicting advice on how to arrange their instruction. By the early nineteenth century, most authorities agreed that anatomical study was crucial to understanding other subjects, and should therefore come early—but when and in what order should one learn pathological anatomy, the principles of medicine, pharmacy, chemistry, or clinical practice?

In the late eighteenth and early nineteenth centuries, more and more student voices were raised against the remoteness of professors, the continued use of Latin in examinations, and—in some classes—the system of examinations, the chronic shortage of human bodies, the lack of practical training, and the crowding of clinics. The tone of protest was often irreverent and sometimes bitter. Many complained of the cold and formal style of some of the lectures, unaltered in some cases from the medieval *lectio,* as professors read in Latin for an hour or more without interruption from a manuscript or perhaps even a printed book.

Scottish students, perhaps because of their young age, were known particularly for their impatience and shrill reactions. The hapless Alexander Monro III was sometimes booed or hissed in anatomy class (as were other professors

at Edinburgh), while even the venerable William Cullen, according to a contemporary account, was known to students as "the Oraclete" because "he generally uses pompous language."[2]

European and American Experiences

In the years between 1770 and 1830, as Lisa Rosner writes in the opening essay, the medical school at Edinburgh was among the most famous in the Western world. What was unique about Edinburgh was that it attempted to provide a full range of medical courses, including surgery and midwifery, and to integrate them with the practical work of the clinic, while still offering a university degree. Its great appeal lay in its willingness to instruct students in various stages of preparation. A guide published in 1792 pointed out that among the students enrolled were some who had served an apprenticeship or already practiced medicine, others who held a medical degree from another university, some who were beginning study *de novo*, and still others who intended to complete their education in London or Paris.[3] It was this loose and informal character of the Edinburgh system that appealed so strongly to students from North America, and influenced the structure of the first American and Canadian medical schools.

The student bodies at Edinburgh and Philadelphia, Rosner writes, were alike in the "student cultures" that developed in the two schools between 1770 and 1830. Using a sociological concept first described in the 1950s—that students and teachers tend to develop a common body of understandings and agreements on the purposes and outcomes of education—she portrays a series of disagreements between medical students and their teachers at the two schools that grew out of these unspoken understandings. A key concept in the student culture of both schools was that students, as rational economic agents, were responsible for their own use of time and that hard work was the mutual expectation of both teachers and students. But at times the mutuality of interest between the two groups broke down over such issues as the scheduling of courses, the assignment of lists of "recommended books," and the taking of shorthand notes during faculty lectures. Some students were so intent on getting a complete transcription of lecture notes, even in courses on practical medicine, that they failed to see the irony in copying notes that urged the necessity of getting practical experience in the hospital! Further conflicts over the subject matter of theses and the content of examinations often led to faculty "clarifications" that inevitably led to reduced student freedom to control their own education.

Students in German universities also enjoyed a large degree of freedom in arranging their studies throughout the entire period under study. The concept of "Lernfreiheit" —or freedom to learn— was a highly valued feature of German university life that enabled medical students to proceed more or less at their own pace, to take courses in whatever order they pleased, and even to switch universities from time to time in order to take advantage of a course, a teacher, or some other advantage offered by another

medical faculty. The medical schools of Germany were more widely spread out and smaller in size than those of Britain or France, and very early engaged in a fierce competition for students and faculty members.

The small size of the German medical schools made it possible for them to offer more individualized instruction, especially in clinical teaching, than was true of most European or American schools. Contrary to a widespread impression, clinical instruction developed very early in Germany and was often the envy of French and other medical students in the early nineteenth century. Especially valued by students, then as now, was actual hands-on experience at the bedside, which often became impossible for the average student in the large hospital wards of Paris and other large cities. In the second essay, Axel Karenberg describes the shift to bedside instruction in German universities after 1770, and the stages through which it passed.

A number of factors, in addition to the small size of classes, were important in the German transformation to clinical training. Karenberg names some of them as the growth in utilitarian expectations during the Enlightenment, the change in the nature of German universities, the adoption of a new governmental policy ("medical police") toward the education of physicians, and the development of the hospital as a site for medical teaching. The shift to clinical training in the medical schools began with the use of ambulatory clinics *(Poliklinikken)* to teach students, then moved to the use of special wards in hospitals in large cities (Vienna or Würzburg, for instance), and finally to the erection of "academic hospitals" in small university towns that lacked a hospital. What was unique about the German students' experience in each of these phases of development was the unusual stress laid on their acquiring actual practice in the care, examination, and treatment of patients. By the 1830s, Karenberg tells us, practical instruction at the sickbed had become a matter of course at almost all German universities.

Women Medical Students

In none of the Scottish, American, or German universities described thus far was it possible for a woman to begin the study of medicine before 1850. In all the medical world, no regularly established medical school consistently opened its doors to women. An occasional woman was able to take over her husband's practice on his death in Britain or America, but that opportunity was declining rapidly by mid-century. The country medical school in Geneva, New York, that gained international fame for allowing Elizabeth Blackwell to enter in 1847, had slammed its doors shut once she had graduated. The reaction to the idea of women doctors was still one of shock and disbelief. The presence of a woman in a hospital, a clinic, or even worse, a lecture on male anatomy or women's diseases, violated every precept of the prevailing social code for the conduct of females. "Woman was obviously designed to move in another sphere," declared the editor of America's leading medical journal in 1849, in denouncing Elizabeth Blackwell's graduation as a

PIONEER WORK

IN OPENING THE

MEDICAL PROFESSION TO WOMEN

AUTOBIOGRAPHICAL SKETCHES

BY

DR. ELIZABETH BLACKWELL

AUTHOR OF

THE MORAL EDUCATION OF THE YOUNG ' ETC.

LONDON

LONGMANS, GREEN, AND CO.

AND NEW YORK

1895

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Blackwell's preface to this classic text read: "It has often been urged that a record should be preserved of some of the first efforts by means of which the medical profession of our day has been opened to women. In the belief that a large providential guidance may often be recognised in the comparatively trivial incidents of an individual life, this request of many friends is here complied with."

"farce." "It is much to be regretted," he wrote, "that she has been . . . led to aspire to honors and duties which by the order of nature and the common consent of the world devolve upon men."[4]

Despite the crushing opposition of families, the public, and the medical profession, however, a surprising number of women in the United States were able to study medicine by the end of the 1850s. As many as three hundred women, according to Elizabeth Blackwell, managed "to graduate somewhere in medicine" by 1859.[5] The vast majority had graduated from either sectarian schools of medicine (homeopathic, eclectic, or botanic), which because of their reform origins or desperate need for students were from the beginning more open to women, or from the special schools for women alone that opened in Boston and Philadelphia about 1850.

But only seven or eight women physicians of the 1850s, including Elizabeth Blackwell, were able to gain entrance to coeducational classes in a regular school of medicine. Surprisingly, six of them were educated at a single school, Cleveland Medical College. In her paper, Linda Lehmann Goldstein describes what is known about each of these unusual women. Why they rejected the chance to study freely at a women's or sectarian school and instead entered the formidable atmosphere of a male college is not known; it can be surmised that they sought the greater prestige and opportunities for recognition that came with a degree from such a school. Most of the women went on to unusual careers following graduation—Emily Blackwell, sister to the noted Elizabeth, became the leader of the women's medical school in New York; Marie Zakrzewska founded the best-known women's hospital of the nineteenth century in Boston; Nancy Talbot Clark was a leader among her all-male classmates, studied in Paris, and became a well-known practitioner in Boston; Sarah Ann Chadwick served as a surgeon with the Seventh Illinois Cavalry in the Civil War; Cordelia Greene headed an important water-cure spa in New York State; while Elizabeth Griselle enjoyed a successful practice in Salem, Ohio.

After 1856, with the impending retirement of the women's champions on the medical faculty and the growing reputation of the women's school in Philadelphia, no further women were accepted at Cleveland Medical College. For the next thirteen years, no other woman was able to graduate from a regular coeducational school of medicine.

By this time, the education of physicians was entering another period of rapid change. The clinical era in medicine was coming to an end. The natural sciences and the laboratory teaching of medicine were transforming study for women as well as men. The women's and sectarian schools had all but disappeared by 1900. Medicine was becoming an almost wholly middle-class occupation, exacting ever-higher levels of preparation and social expectation. Costs were rising so steeply that medical study was denied to ever more segments of society. But many of the concerns of this long-forgotten era—the conflicting expectations of students and teachers, the need for bedside experience early in

a student's career, the discrimination against women and other social groups—continue well into our own time.

Notes

1. Johann Steger to parents, April 25, 1813, in Ernst Bezel, ed., *Johann Jakob Steger, 1798–1857; Beispiel eines Medizin studenten im früben 19. Jahrhundert nach den Briefen an seine Eltern* (Zurich: Juris Druck & Verlag, 1981), 46.

2. "Letter of Thomas Ismay, Student of Medicine at Edinburgh, 1771, to his Father," *University of Edinburgh Journal* 8 (1936–1937): 59.

3. J. Johnson, *A Guide for Gentlemen Studying Medicine at the University of Edinburgh* (London: Robinson, 1792), 54–55.

4. *Boston Medical and Surgical Journal* 40 (1849): 1.

5. As cited in Mary Putnam Jacobi, "Women in Medicine," *What America Owes to Women*, ed. Lydia Hoyt Farmer (Buffalo: National Exposition Souvenir, 1893), 384.

Thomas Neville Bonner is Distinguished Professor of History at Wayne State University. The author of four books and numerous articles in medical history, his most recent publication is* To the Ends of the Earth: Women's Search for Education in Medicine *(Harvard University Press, 1992). He has completed a comparative history of medical education entitled* Educating for Medicine: From the Enlightenment to World War II, *which is currently in press at Oxford University Press.

Student Culture at the Turn of the Nineteenth Century: Edinburgh and Philadelphia

Why do students and professors disagree? The question has probably perplexed teachers everywhere and at all times, often wailed—by professors—in the form of "Why don't students listen to us?" Surely professors and students are engaged in a common enterprise, and one intended only to benefit the students themselves. Why, then, do students misread or refuse to follow clear instructions, ignore recommendations on how to study, and hand in essays that do not fulfill requirements for graduation? If that kind of behavior was limited to unintelligent or uninterested students, or encountered only by unintelligent or uninterested teachers, it would be more comprehensible. The perplexity arises when a "good" student disagrees with a "good" teacher, or when the source of the disagreement cannot be traced to lack of ability, interest, or industry on either side.

One explanation for student-teacher disagreements was suggested in the 1950s by a group of sociologists led by Howard Becker engaged in a participant-observation study of students in an American medical school. Researchers concluded that student response to faculty instruction was mediated by student culture—that "body of understandings and agreements among students about matters related to their roles as students . . . why one goes to school and what he expects to get out of it, how one should behave toward a teacher, what things are worth learning and why, how to pass examinations, how to avoid punishment."[1] Those "understandings and agreements," even if expressed by conscientious students, frequently differ from what faculty might like because students had their own set of preoccupations and concerns that influenced their behavior. That did not mean that students' ideas on, for example, how to pass an examination were unrelated to what faculty said and did; indeed, they could be heavily influenced by faculty statements and behavior. Still, Becker's study found that students tended to interpret

by Lisa Rosner

CHAPTER VI.

Connection between the medical department of the College of Philadelphia and that of the University of Edinburgh—Sketch of the origin of the Edinburgh school and of its position in 1768—Dr. Cullen.

FROM a comparison of the course of instruction in the College of Philadelphia, from the time of its inception to that of its complete organization, with that of the University of Edinburgh, there can be no doubt that this distinguished school was taken as the model for imitation.

The individuals who composed the medical faculty of the College, the first occupants of the chairs, were graduates of the Edinburgh school, and had unavoidably acquired an affection and preference for its system of instruction. They were familiar with all its details and methods; and on assuming their positions the bright days of their student life were vivid in their memories. Regarding with reverence and enthusiastic admiration the men who had been their preceptors, it was most natural that these zealous colonial students should desire to transfer to their native shores the peculiar doctrines that had been inculcated, as well as the stores of learning of which they had been the recipients.

But further, between our own school and that of Edinburgh the parallelism is so close as to be worthy of particular attention; indeed, the resemblance can only be explained by the laws of descent which mould the features of the child like those of the parent, and impart similar moral and mental characteristics. The medical school of Philadelphia may be said to be the legitimate offspring of that of Edinburgh. The latter had its origin with the Scotch students in attendance upon the lectures of the University of Leyden, who forty years previously were actuated by the same motives which prompted the American students, while abroad, to the projection of their enterprise.

We are told by Dr. Fothergill that "there had long been

"The medical school of Philadelphia may be said to be the legitimate offspring of that of Edinburgh," according to Joseph Carson's History of the Medical Department of the University of Pennsylvania.

even apparently unambiguous faculty messages in the light of their own ideas.

In this essay I intend to use the concept of student culture to explain cases of professor-student disagreement in the medical schools of the universities of Edinburgh and Pennsylvania at the turn of the nineteenth century. Edinburgh University was one of the most prominent medical schools in the world from 1760 through 1830; its Golden Age was the late eighteenth century, but it continued to attract more students than any other medical institution in Britain right through the 1820s. The University of Pennsylvania medical school, modelled on Edinburgh's, quickly became influential in its own right, attracting more than two hundred students per year and serving as a model for many of the American medical schools established in the nineteenth century.[2]

Medical Education at Edinburgh and Philadelphia

The system of medical education promoted at the University of Edinburgh and transplanted to the University of Pennsylvania contained within it the seeds of several features of what became the modern medical curriculum. The first was a concentration on medical subjects (instead of literary scholarship, which was the core of medical education in Oxford and Cambridge), each taught by a separate specialist in the field. Both universities offered all of the subjects enlightened medical thought considered essential: Anatomy and Surgery, Chemistry, Materia Medica, Botany, Midwifery, Medical Practice (which covered diseases and their treatment), and Medical Theory, which included Physiology. The second feature was clinical lectures on hospital patients, taken from the wards of the Royal Infirmary in Edinburgh and the Pennsylvania Hospital in Philadelphia. Clinical lectures provided students with actual bedside experience, and both universities were at the forefront of professional education by incorporating such experience into the university curriculum prior to actual independent practice.[3] Another feature that distinguished the curriculum was the rigorous requirements for graduation. Edinburgh students had to complete three years of university study, attend every class offered by the medical faculty except Midwifery, complete oral and written examinations in Latin, and write a Latin thesis. From the 1820s, those requirements were made even more rigorous by the addition of new required courses and a fourth year of study. Requirements at the University of Pennsylvania, although not quite as strict as those at Edinburgh, still set the standard for American medical schools. After the reorganization of the medical school in 1796, candidates for graduation were required to have two years of university study, to pass an oral examination, and to write a thesis. Candidates were able to use English for their examinations and thesis, rather than Latin.

The course of study at both medical schools differed from their modern counterparts in several important respects. For instance, only those students intending to graduate were required to attend any particular set of courses. This affected only one in five of the Edinburgh students and two in five at

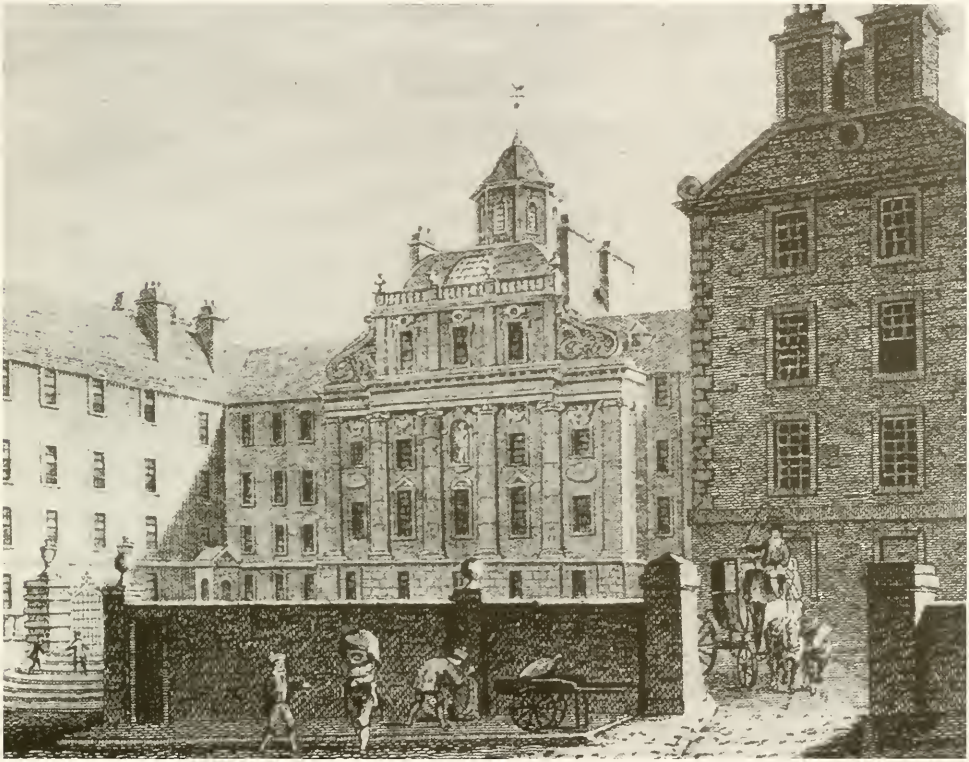
Pennsylvania. The rest attended whatever courses they wished, in whatever order they chose. Even graduates were not required to take courses in any particular order. Professors, when asked, usually advised taking Anatomy and Chemistry before Medical Practice or attending Clinical Lectures, but there was nothing compelling a student to ask, or to follow advice when it was offered. Moreover, there were no class examinations or attendance rolls in any lecture. The result was that students (or sometimes their fathers or other advisors) determined the course of study with no institutional or faculty constraint.

The Student as Consumer

That system of education developed in part out of economic realities. No national regulation required a medical degree or a particular course of study to practice. All that a practitioner really needed was the ability to cure patients—or at least convince them he could cure them; simply attending medical lectures without graduating might be sufficient. University medical education was expensive (though the expense was expected to pay off in the form of knowledge needed for practice). All but the wealthiest students had to try to get the most education in the shortest period of time in order for the education to be cost-effective. Many could not afford several years of study leading to a degree, while others decided that the degree was simply not worth the money. Indeed, nearly 80 percent of Edinburgh and Pennsylvania students who did not graduate studied for only one year. Still, they were able to become respectable practitioners. As John Rutherford told his Edinburgh students in 1749, "I hope my lectures will produce good effects, at least contribute in some measure to make you good physicians and not quacks. I don't mean by that you should all take out degrees, for I am far from thinking a diploma furnishes a man [with] medical knowledge, his improvement in the art depends upon his own study and industry, so that a person may be a good physician without that piece of ceremony."[4]

As student and faculty demand for some form of accreditation grew in the nineteenth century, the idea that medical ability depended on the student's own "study and industry" continued to meet almost unanimous agreement. Alexander Lesassier, after a year of study at Edinburgh, for example, wrote in his diary in 1805, "[H]ereafter I can rank with the highest of them—Oh! delightful thought."[5] In a way he did. Lesassier rose in the army medical service during the Peninsular War to become one of two British field surgeons to be mentioned in official dispatches; the other, David MacLagan, was an Edinburgh M.D.[6] In Philadelphia, too, one-year students became respectable practitioners: Jacob Gilliams, who attended classes at the University of Pennsylvania in 1815, for example, practiced for many years down the street from Samuel Emlen, Richard Harlan and Richard Mason, all University of Pennsylvania graduates.

The pervasive image of students as rational economic actors also emphasized the importance of student initiative, an image best expressed by Adam Smith in *Wealth of Nations*.



The Royal Infirmary

"Where masters . . . really perform their duty," he wrote, "there are no examples, I believe, that the greater part of students ever neglect theirs. No discipline is ever requisite to force attendance upon lectures which are really worth the attendance."[7] In Smith's view, the way to maintain excellent education was to make sure that professors had incentives to offer the best lectures possible; consequently, students would recognize that it was in their own best interest to attend. Students, too, agreed that they had a definite economic incentive to choose the best lectures, and to attend them diligently. As one student, Thomas Ismay, wrote home to his father, "When I consider the Money that it will cost me during my Stay at this place, it makes me confine myself too close to my Study, more so than is conducive to my health."[8]

The ideal of the student as rational consumer of medical education was strong enough at Edinburgh to be brought out whenever the issue of greater control over students was raised. When, in 1826, a royal commission recommended class examinations and attendance checks, the Edinburgh medical faculty responded that they were unnecessary. "The great body of medical students in this university have arrived at years of discretion," the faculty told the commission. "All of them are perfectly aware that the business in which they are engaged, is to be the foundation of their character and fortune in future life."[9] Professors transmitted the same message. In Andrew Duncan's introductory lecture in Medical Theory, for example, he counseled that "Every man of integrity enquiry &c must be a Student for Life when he enters on the Practice and Study of Physick."[10] William Cullen told his Chemistry students: "When one considers that a young man . . . has always set before him the alternatives of ease wealth and honour on one hand or of dependence beggary and contempt upon the other we should suppose ourselves secure of his diligence in study." Of course, Cullen went on, it did happen

William Cullen 1710–1790

that young men were too little influenced by these "distant views," but his solution was to try to make Chemistry such an intrinsically interesting subject that no other motivating force would be needed.[11]

In the days before national regulation of medicine and control of the curriculum by faculty, each student was allowed to choose his own course of study. The resulting student culture had a high degree of independence; what students did during their medical education was entirely up to them. Hard work—though not necessarily as measured by examination—was essential and would have a great impact on their future. The University of Edinburgh was known to encourage hard work long before John Playfair's famous comment that Oxford and Cambridge taught a man how to spend £1,000 per year, while Edinburgh taught him how to make it. As Mary Hewson put it in 1795, when exhorting her son Thomas to leave London for Edinburgh: "It is very likely that more practical knowledge in medicine may be acquired in [the great hospitals of] London and Paris, but the question is, will a young man apply as much in either of these cities, as he will in a University, where every branch of science is regularly taught, and drawn together so compactly from one to the other?"[12]

What both Edinburgh and Pennsylvania universities provided students, then, was not just fewer distractions than London or Paris but also a structure that encouraged students to "apply themselves." The systematic teaching of "every branch of science," as Mary Hewson described it, took place every academic year. Each fall students could count on arriving in town, signing the matriculation records, and finding the classes they needed to take. Professors took their obligations seriously, teaching for one hour daily from Monday through Friday, revising their lectures as their subjects changed, and offering additional classes to especially interested students.

Students, too, took their work seriously. Benjamin Rush wrote that when he studied at Edinburgh, there was "such a spirit of emulation reigning among the students here that a man must forego all hopes of making a figure unless he is always employed."[13] Student diaries contain many references to the strenuous schedule. Alexander Lesassier, for example, wrote, "My present mode of life tho' a very busy one, yet is extremely dull nothing but running from Class to Class all day long."[14] At the end of the session, the number of hours spent in lectures often increased, for as professors began to run out of time, they sometimes lectured twice a day or on Saturdays.[15] The latter was too much for a group of seventy-nine students who protested that the "deprivation of our only holiday" required them "to appropriate, either to recreation or study that day [Sunday] which we feel should be devoted to far different purposes."[16]

In addition, the host of medical student societies shows that students willingly gave their free hours to such pursuits as writing and debating papers on medical and scientific subjects. Although the societies were regulated by students themselves, with no faculty intervention, attendance was mandatory

William Cullen's house at Hamilton

at the weekly meetings and absence was punished by a fine. Discussions often went on for several hours, and participation was taken seriously as a sign of distinction. Sylas Neville, elected one of the presidents of the Royal Medical Society in Edinburgh in the 1770s, came near to "having a duel on my hands" for a quarrel over particularly divisive medical theory.[17]

Student-Faculty Disagreements

With such large areas of agreement between students and professors, it may seem that there would be little room for disagreement. In fact, however, the mutual insistence on a student's responsibility for his own education, together with a joint sense of the importance of the intellectual enterprise in which they were engaged, seems to have overridden at times the more precise instructions about study that professors gave to students. This can be seen in the response of students to that acclaimed feature of Edinburgh medicine, the teaching of medicine "in all its branches" by authorities in each field. Lectures were organized so that students could, in theory, take all the courses offered each year, though few did. Professors had their own customary lecture halls, wherein they set up demonstrations or made other preparations as necessary for their lectures. That system of organizing knowledge according to the hours in the teaching day was generally adopted by students to help them organize their own work. Samuel Bard, from New York, wrote his father:

> My day in general, is thus spent: from seven to half after ten I am at present employed in [studying] mathematics, which will soon . . . be changed for professional reading and the examination of my notes; I then dress, and am by eleven at college, attending [lectures in natural philosophy] until twelve; from that hour until one, at the hospital; from one till two, with Dr Cullen [on Medical Practice]; from two to three, I allow to dinner; from three to four, with Monro in anatomy; from four to five, or half an hour after, I generally spend at my flute and taking tea . . . after this I return to my study, and spend from that time until eleven o'clock, in correcting my notes, & in general reading.[18]

Once internalized, that habit of scheduling could be of advantage under less structured conditions. The schedule of Francis Augustus Bonney, an Edinburgh student, combined moral and medical improvement: "Plan for the week. Monday, temperance, chemistry; Tuesday, chastity, anatomy; Wednesday, meekness, mat[eria] medica; Thursday, contentedness, pract[ice] of med[icine]; Friday, honesty, surgery; Saturday, industry, midwifery; Sunday, religion."[19]

That system of dividing medicine into different "branches," each of which was separately taught, did present a pedagogical problem. Modern medical students complain about having to learn biochemistry from a biochemist, or bacteriology from a bacteriologist, because each course has its quite separate body of material, not obviously related to the others. Students often find it very difficult to integrate the information from separate classes, or relate it to their expectations of

practice; they deal with it by concentrating their attention on whatever course they are currently in.[20] The medical student of the nineteenth century, too, had a difficult time integrating the material from separate classes into a coherent whole. As Professor Robert Christison explained: "[S]o far as regards the fundamental sciences of anatomy, chemistry, [and] physiology . . . the attention of the student to them is almost confined to the period during which he attends each class. One science drives out the last, just as he passes from one classroom to another."[21]

At times the schedule itself could supercede the content of the lectures. When the college bell in Edinburgh rang on the hour, students would instantly rise up and rush to their next class. Christison recalled that on the last day of class, the bell rang while Professor James Gregory was in mid-sentence. "The whole students at once sprang to their feet, according to custom," he said, "to rush to the Chemistry class. Professor Gregory stood up too, raised his arm, and called out 'Stop! stop, gentlemen! . . . one word at parting!' But no one stopping, he shouted, 'Well, well! God bless you all!' Such was his farewell to [the class]."[22]

To help students integrate the materials of medicine, professors often gave what they considered unambiguous instructions on how to study. Nearly all professors began with a list of recommended books, often including such ancient authors as Hippocrates and Galen, but concentrating on modern ones: Sydenham, Boerhaave, Haller, Morgagni, and of course such Edinburgh authors as Cullen and Gregory. Students were told not to memorize such books but rather to compare them critically with the writings of other authors on the same subject. "Reading is one of the greatest sources of improvement," Professor Andrew Duncan told his students, "but some authors are to be received with caution. Hence a necessity of selecting authors but to execute this requires great sagacity. I shall point out systematically who are to be consulted

Benjamin Rush, celebrated professor at the University of Pennsylvania, recalled in his* Autobiography *: "The two years I spent at Edinburgh I consider as the most important in their influence upon my character and conduct of any period of my life."

on every subject and on [particular] subjects [particular] authors as these occur."[23]

A student's response to such reading lists can be seen in Sylas Neville's diary from his first year of medical studies: "Wed. Nov 6. [Professor] Monro in his lecture today recommended a vast number of books in Anatomy. Dennison [a fellow student, then in his second year] says he never reads half of them himself, and that his method is to examine the plates and look into part of a work by which he can give an account of the whole." Neither Neville nor Dennison regarded their practice as neglecting their work. Instead, Neville justified it both on practical grounds—"[I]t would take half a man's lifetime to read all he shewed us today"—and by appealing to Monro's own lecture. Monro, like Duncan, argued that some medical books "must be received with caution"; and thus he carefully explained to students problems with earlier writers. Neville, understandably, concluded that "some [of the recommended books] are not worth reading, as may be seen from the notes I took of the lecture."[24]

Cullen was equally explicit in the introductory lecture to his course on Medical Practice. "I suppose you divided into two classes," Cullen said, "those who come here for the first time, and those who have learned some system. The business of those in the first class, is to form a system and learn one system only, the attending to a variety of opinions must be perplexing." For that reason Cullen did not recommend a whole series of books. Instead, he told his beginning students, "[I]n your situation you are at the mercy of the professor, and must take the system which he explains. The [textbooks] which I have published are far from being perfect, but they are the best I can offer, and they are now received over the whole of Europe."[25] That was straightforward enough, but Cullen went on to explain "the most proper method of using this book." "I would advise you," he said, "to read over carefully as much as you expect that I will consider at my next lecture. If you do not understand every part, those that are difficult will engage your attention during the Lecture. . . . As the particulars of an hour's lecture are with difficulty remembered, read over the text after, and endeavour to recollect what hath been heard." The student would thus have been actively engaged with the material three times in succession.[26]

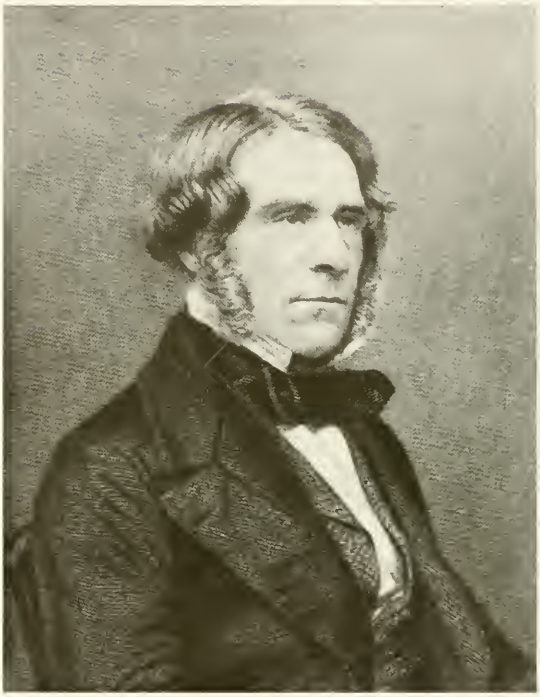
Some students may have followed his advice. Thomas Ismay wrote to his father that he was "obliged to buy several books to read on with the professors, which if I intend making any progress I cannot avoid." Ismay's schedule suggests that he followed at least the first part of Cullen's suggestion, for he rose, he wrote, "about 7, read till 9, then go to Dr. Cullen's Class, come back at 10, then breakfast and transcribe the Notes which I have taken at his Lecture." He spent the rest of the day equally industriously. "From 12 to 1 [I] walk in Infirmary," he continued:

> from 1 to 3 attend [Anatomy]. Then come and dine, and as you may suppose I am

> very hungry. From 4 to 5 attend [Midwifery], from 5 to 6 transcribe the notes I have taken . . . from 6 to 7 attend Private Demonstrations [in Anatomy], from 7 to 9 transcribe the Lectures I have borrowed and at 9 get Supper; from 10-12 write Lectures besides every Tuesday and Thursday from 5 to 6 o'clock I attend the Clinical Lectures.[27]

Certainly Ismay worked very hard. But much of his time was spent not reading or studying textbooks but in transcribing lectures either from his own shorthand notes or by borrowing other students' copies. Extensive notetaking was not an activity recommended by professors, however. "With respect to taking notes there can be nothing more useful and proper," Cullen told his students, "but as the attention is abstracted by them, therefore make them short, otherwise you will lose more than you gain." In other words, notes were aids to active engagement with the material, not substitutes for a textbook. "Those taken in shorthand," Cullen added, "are often grossly erroneous and are always imperfect."[28] Yet many of the lecture notes that have survived must have been taken in some form of shorthand, because they appear to be word for word transcriptions of each lecture. They may even have been taken down and transcribed by someone other than their student owner, who simply bought them. That was certainly one way of obtaining information, but it was still not active involvement with the material.

It is easy to see why students might have neglected faculty advice on taking shorthand notes in order to obtain a complete copy of the lecture. Professors presumably regarded the goal of medical education—the end product—to be the "improvement" of the medical student. That would result less from transcribing lectures than from the process of critical evaluation and integration of material. Students, though, wanted a more tangible product, several volumes' worth of lecture notes from their eminent professors that could be used as reference works when they began practice. After



Robert Christison 1797–1882

all, as Cullen had said, "[A] young man . . . has always set before him the alternatives of ease wealth and honour on one hand or of dependence beggary and contempt upon the other." The lecture notes, carefully copied, served as a more comforting form of insurance for the future than mere attendance or even study.

Clinical Experience

We can see this especially clearly in the copies that were made of clinical lectures. Again, opportunities for clinical experience in hospitals in Edinburgh and Philadelphia were among the most acclaimed features of the medical education of the universities in those cities. Sylas Neville, as other students, was disappointed that John Gregory's death in 1772 prevented him from ever attending the great professor's clinical lectures. Neville instead acquired a "copy accurate and complete as the original" of notes from Gregory's clinical lecture course in 1771.[29] He did this with no apparent awareness that making a copy of lecture notes was not at all the same thing as getting practical experience for himself, and that he would have been truer to Gregory's precepts if he had spent his time at the hospital, not reading lecture notes.

"The bad consequences of studying medicine from books and the lectures of professors," Gregory had explained in his introductory lecture, are that a "gentleman can declaim on the causes of diseases . . . but [if] he was never conversant with the sick, he is embarrassed with his erudition, and perplexed in cases, in which an apothecary's apprentice would find no difficulty."[30] We know that these were Gregory's exact words because they were carefully transcribed and copied; in fact, they can be found in surviving copies of his lectures from 1771, "accurate and complete as the original," in libraries in Edinburgh, London, New York, and Philadelphia. Students could have chosen to spend their time taking another course of clinical lectures instead of transcribing notes; that they did not shows that enthusiastic approval of a professor's lectures by students might lead to behavior that he would not have liked. Sixty years after Neville's experience, Samuel Lewis turned down an offer to be a dresser in the Royal Infirmary, a good opportunity to acquire clinical experience, because, as he recalled: "If I had become a dresser I should have been obliged to spend at least an hour and a half daily in the Hospital, and that would have been so much time lost in making myself fit for my approaching examination. There is little to learn as a dresser, all that you are allowed to do is to bandage ulcers etc. and one must be a very stupid fellow who can't learn all the mystery of bandaging in three months."[31]

Medical students of our time have been known to make the same choice, and for the same reasons: they come to believe that the often routine work associated with treating hospital patients is less important for their future practice than other forms of education.[32]

Examinations and Theses

For the majority of students in Edinburgh and Philadelphia, these sharp differences in faculty and student expectations did not cause open conflict,

Pennsylvania Hospital in Philadelphia, 1799

primarily because students who did not graduate were never tested. Those who sought a degree, however, had to fulfill faculty requirements. Once the candidate had completed all the required classes, the first stage in the graduation process at both medical schools was an oral examination. Student rumor held that the first examination was the most important; as George Logan reported from Edinburgh, "[T]here is hardly an instance of a Gentleman being degraded [later]."[33] Student rumors were not always accurate, of course, but they indicate that recognition of the importance of the first examination was an area of student-professor agreement. Although between two and five students each year were rejected during their oral examinations, none ever publicly claimed that their rejection was unfair or unwarranted. Students seem to have accepted the authority of the medical professors to reject candidates on the basis of examinations.

That is in sharp contrast to student protests over rejection of graduation theses. Edinburgh and Pennsylvania students were unusual in being expected to write their own theses: far more common was the practice in continental universities of students' defending propositions assigned them by their professors. Both students and professors agreed that theses must, indeed, be a student's own work. Sylas Neville wrote of the "mean and contemptible conduct of those who publish the compositions of other men as their own"; also, a candidate for graduation at the University of Pennsylvania who plagiarized his thesis by copying, word for word except the title page, another student's thesis, did not contest the faculty's decision to reject it.[34]

What students did object to, however, was professorial control over the subject matter of the theses. Most graduation theses consisted of well-written expositions on well-known topics, but a few—such as Joseph Black's on Magnesia Alba—were genuine contributions to scientific literature. Many an ambitious student hoped to follow Black's example in his own thesis.

Benjamin Rush, professor of Chemistry at the University of Pennsylvania, encouraged that hope in his comments on graduation theses. Only two of the eleven theses that he read in 1809 received no compliments. The rest were praised in varying degrees, ranging from the limited ("I have no objections to make to this thesis") to the enthusiastic ("I have read this dissertation with pleasure and instruction" or "This thesis has real merit"). Rush's enthusiasm explains why students did not expect to fail because of their thesis. Even more important than the commendations alone, though, was the fact that Rush evaluated the theses as serious pieces of medical literature. By praising the reasoning powers displayed in a thesis, by saying that one student "had done honor by his dissertation both to himself & to our University," Rush reinforced the ideal of the original thesis. He reinforced it further by recommending to one candidate to continue his work on pulmonary consumption, saying: "A certain remedy must exist . . . who knows

but a discovery of it may be reserved for one of the graduates of 1809 in our University." [35]

Nor was it necessary for a student to agree with Rush's teachings in order for his thesis to be acceptable, though a student probably had to be very sure of himself to do so. "It has long been the practice of the medical professors of this university," Rush wrote on one student's thesis, "to allow candidates for degrees to dissent from the opinions which are taught in this University."[36] Such dissent had to be made in a gentlemanly and courteous way, of course, but the freedom to contradict professors was implied, again, by the idea that the thesis was the student's own hard work. Like other scholars, he had to be free to express the truth even if it contradicted his examiners.

That was the issue that created the greatest conflict. Students and professors in Edinburgh in the 1780s were divided over the merits of the theories of John Brown, who mounted, among other things, an attack against the system of nosology (or medical classification) taught at the university. One candidate, John Wainman, was told by Professor Alexander Monro to remove quotations from Brown's *Elements of Medicine* from his thesis.[37] Wainman protested, saying, "1st . . . I am prevented from saying what I really believe, to the manifest injury of my Dissertation. 2dly . . . I am deprived of the liberty other candidates have always enjoyed, in making quotations from any author."[38] Significantly, Monro did not challenge Wainman's point that a thesis should say what the author really believed, for to do that would undermine the value of the exercise. He did, however, assert his authority by responding, "As to the liberty you say 'candidates have always enjoyed'. . . I never heard of it before; and am determined to give it no quarter neither now nor hereafter."[39] Monro had university policy on his side. Since the faculty had the authority to approve each thesis before the university gave "sanction to its publication," they clearly did have the power to refuse a thesis.[40] Wainman was probably not convinced, however, and another student concluded that Monro's behavior had been a "downright outrage."[41]

A similar conflict over theses arose at the University of Pennsylvania. In the early years, candidates for graduation underwent an oral examination in March or April, at which point they presented their theses to the faculty for inspection. Only students who had passed the oral examinations could advance to that stage. Some students clearly concluded that the examination was thus the most important activity; as for the thesis, they could write whatever they wished.

In 1809, two students, Fabricius Perry and Thomas Holland, submitted theses that were, according to the professors, "so extremely faulty in every respect, that they . . . cannot be admitted to the degree of Doctor of Medicine."[42] Although specific comments on Holland's thesis are lacking, Perry's was one of only two that Rush did not compliment that year.

Both students protested the rejection of their theses. "I cannot but believe that your conclusion is premature or founded on data unfair on my part,"

Hall of the Royal College of Physicians, Edinburgh

Holland wrote. In his defence, he argued that his topic was too difficult for him to do justice to, and he assured the faculty that "if they will select a subject and I do not write to their satisfaction on it, I will then think myself impartially treated and abide the decision as just." Most of the letter, though, was taken up by his anxious assurances that he had never intended to speak disrespectfully of any member of the faculty—which he apparently considered the real reason he was rejected. It clearly had not occurred to him that he could be rejected because of his thesis alone, and his letter suggests that he still did not quite believe that this was the reason.

Perry was more explicit about the common student assumptions concerning theses. "I have already submitted myself to an examination before the Faculty," he wrote: "Immediately after that examination, I was officially informed, that I had given satisfaction. . . . My payment of the fee, the subject of my dissertation being admitted of, connected with the declaration of the faculty, are all proofs that I had given satisfaction." Perry had simply assumed that he had passed, and he had already told his "affectionate sisters and other connections, that I have graduated, or passed an examination which was considered tantamount to it. And will you, gentlemen, follow me in imagination, and view them when I inform them, that the deserved, anticipated honors have been snatched away?"

What is noteworthy in both cases is that students felt that it was unfair for them to be rejected. Neither conceded any faults in their theses that were sufficient to bar them from graduation. Both focused on faculty approval of the subject matter of the thesis, rather than its contents, which, they apparently considered to be their own affair. The faculty did allow both students to write another thesis, and perhaps the faculty agreed that the students were at least partly justified in their protests. Eventually, both students did pass.

As a result of that conflict, though, the regulations were changed. After 1811, a thesis was required to be handed in prior to the examination, and its "admissibility" was ascertained before the student was tested. Even that did not entirely solve the problem, however, for in 1820 John Lofland was told to correct the spelling and technical terms of his thesis before it could be accepted for a degree. He responded "with considerable effrontery" (according to the minutes), charging that the faculty had shown "undue partiality in their examinations." As at Edinburgh, students challenging faculty decisions found themselves at a disadvantage, and Lofland was no exception. The faculty resolved "That this Gentleman should not be admitted to an Examination in this School, without previously making a satisfactory apology."[43] This time they did not concede that the student had been justified in his protests.

To prevent future conflicts, the faculty resolved a year later "that a Thesis handed in to them for examination, is not to be returned by the Dean to the author—if rejected upon it;—but that it be retained as the property of the Faculty, to vindicate their opinions."[44] By now, policy was well-enough established that further protests or student

View of the University dome, Edinburgh

pleas for exemption could be rejected with the comment "the faculty [does] not hav[e] the power to abrogate the law of the Trustees on this subject."[45]

The Lofland case can serve to demonstrate a frequent faculty response to the question of why professors and students disagree: they need only clarify existing regulations or promulgate new ones to remove the source of conflict and give them the authority needed to resolve the issue. Such actions were increasingly taken over the course of the years ahead. The solution to student protests over rejection of theses was that the matter would be judged by professors, not students. Student assumptions that clinical experience was less important than other forms of education was dealt with by making first one, then two years, of clinical work mandatory for graduation. Student attention to the content of reading lists and courses was ensured by the introduction of class examinations. A background in basic sciences prior to taking medical classes was ensured by the introduction of prerequisites and other sequencing schedules. And compliance with the whole set of faculty instructions was enforced by the legal requirement that all practitioners had to earn a medical degree, given after fulfilling a set of strict university requirements.

Yet even the strict regulations that have become part of modern medical education—some so deeply imbedded in our educational system that we have forgotten their origins—have not eliminated the "significant redirections of educational aim and effort" that Becker and Geer found to be the unanticipated consequence of student culture.[46] A recent manifestation of it, in fact, comes from these very regulations, laid out in greater and greater detail over the years—namely the tendency of modern students to assume that once having fulfilled the regulations, their education is complete. Suggestions for additional reading or independent research are frequently disregarded. Robert Christison had noted this tendency in Edinburgh as early as 1824. The medical professors, he wrote:

> are probably not aware how much their Regulations influence the students in their medical pursuits. These Regulations, it is presumed, are intended, by their framers, only to enforce such studies as are absolutely indispensable for graduation—not to point out what course of study is desirable to form a thorough physician. . . . I have some reason to assure you with confidence . . . that, besides following what you prescribe, they are too apt to stick to the strict letter of your statute, by not following what you do not prescribe.[47]

Like Christison, many modern professors expect a student to do more than simply fulfill the statutes: He or she should "rely on his [or her] own study and industry," be "a student for life" and deserve credit "for his [or her] knowledge & ingenuity in his profession"—in other words, be much like an Edinburgh or Pennsylvania student at the turn of the nineteenth century.

Notes

1. Howard Becker and Blanche Geer, "Student Culture in Medical School," *Harvard Educational Review* 28 (Winter 1958): 71. The study is described at length in Howard S. Becker, Blanche Geer, Everett C. Hughes, and Anselm L. Strauss, *Boys in White: Student Culture in Medical School* (New Brunswick, N.J.: Transaction Books, 1977).

2. For a more complete discussion of these two universities, see Lisa Rosner, *Medical Education in the Age of Improvement: Edinburgh Students and Apprentices, 1760–1826* (Edinburgh: Edinburgh University Press, 1991) and "Thistle on the Delaware: Edinburgh Medical Education and Philadelphia Practice, 1800–1825," *Social History of Medicine* 5 (1992): 19–42.

3. Neither university was the only, or even the best, place to get clinical experience: the hospitals of London or Paris or other large cities provided far more material for the ambitious student. But until the 1830s Edinburgh was the only university in Great Britain to make clinical lectures an integral part of the curriculum, while the University of Pennsylvania had the best facilities of any American university.

4. John Rutherford, "Clinical Lectures," vol. 1, lecture 1, Jan. 11, 1749, Edinburgh University Library, Dc.3.90.

5. Alexander Lesassier Diary, Nov. 11, 1805, box 11, folder 77, Alexander [Lesassier] Hamilton Collection, Library of the Royal College of Physicians of Edinburgh.

6. Both Lesassier and MacLagan were mentioned in the dispatches of William Carr Beresford. The Duke of Wellington frequently included a general thanks to James McGrigor, director of the Medical Department in the Peninsula, and his staff.

7. Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (London: Ward, Lock, & Tyler [n.d.]), 604.

8. "Letter from Thomas Ismay, Student of Medicine at Edinburgh, 1771, to His Father," *University of Edinburgh Journal* 8 (1936–1937): 59. Ismay's is especially poignant because he did die in Edinburgh a few months later.

9. *Evidence, Oral and Documentary: Taken and Received by the Commissioners Appointed by His Majesty George IV, July 23rd, 1826; and Reappointed by His Majesty William IV, October 12, 1830, for Visiting the Universities of Scotland*, 4 vols (London: H. M. Stationery Office, 1837), vol. 1: *University of Edinburgh* (cited hereafter as *Evidence . . . Edinburgh*), Appendix, 262.

10. Andrew Duncan, Sr., "Lectures on Medical Theory," Edinburgh University Library, Gen. 553D.

11. William Cullen, "Lectures on Chemistry," ca. 1755, William Cullen Manuscripts, #11, Royal College of Physicians of Edinburgh Library.

12. Mary Hewson to Thomas Tickell Hewson, July 9, 1795, B H492, vol. 2, #32, Hewson Papers, American Philosophical Society Library, Philadelphia.

13. L. H. Butterfield, ed., *Letters of Benjamin Rush*, 2 vols. (Princeton: Princeton University Press, 1951), 1:40.

14. Lesassier Diary, Dec. 13, 1805.

15. *Evidence . . . Edinburgh*, Appendix, 204.

16. Ibid.

17. Basil Cozens-Hardy, ed., *The Diary of Sylas Neville, 1767–1788* (London: Oxford University Press, 1950), 241.

18. John Vickar, *A Domestic Narrative of the Life of Samuel Bard, MD, LLD* (New York: Literary Rooms, 1822), 35.

19. Francis Augustus Bonney, "Diary, 1827–1836," Edinburgh University Library, Gen. 782/4/3.

20. Becker et al., *Boys in White*, 80–91.

21. Robert Christison, "Memorial to the Principal and Professors of the University of Edinburgh," Oct. 13, 1824, Edinburgh University Library, P.470/26, 4.

22. Robert Christison, *Life of Sir Robert Christison, Bart.*, 2 vols. (Edinburgh: William Blackwood and Sons, 1885), 1:80.

23. Duncan, "Lectures on Medical Theory."

24. Cozens-Hardy, ed., *Diary*, 139; Becker et al., *Boys in White*, 107–35.

25. William Cullen, "Clinical Lectures" (1770?), Manuscripts Section, College of Physicians of Philadelphia. These are actually his lectures on medical practice; the textbook was *First Lines of the Practice of Medicine*, which went through many editions.

26. Medical students at the University of Kansas in the 1950s were given similar advice by faculty; if they followed it, they would have gone through the material four times (Becker et al., *Boys in White*, 91).

27. "Letter from Thomas Ismay," 60.

28. Cullen, "Clinical Lectures."

29. Cozens-Hardy, ed., *Diary*, 208.

30. John Gregory, "Notes from Dr. Gregory's Clinical Lectures in the Royal Infirmary, 1771," 3–4, Royal Medical Society Manuscripts, Royal Medical Society, Edinburgh.

31. Samuel Lewis to Mrs. W. P. Hinds, Edinburgh, Oct. 12, 1837, Samuel Lewis Correspondence, Edinburgh University Library, Gen. 1429.8.

32. Becker and Geer, "Student Culture," 77–78.

33. George Logan to Charles Logan, Edinburgh, March 2, 1778, Dr. George Logan's Journal, 1775–1779, Historical Society of Pennsylvania, Philadelphia.

34. Cozens-Hardy, ed., *Diary*, 223.

35. Ibid.

36. Benjamin Rush, "Rush's Manuscript Commentary on His Students' Theses, April 1809," Rush Manuscripts, box 11, Yi2,7404, F12, Library Company of Philadelphia Manuscripts, Historical Society of Pennsylvania.

37. John Wainman, *De Epilepsia* (Edinburgh: Balfour and Smellie, 1781).

38. As cited in Robert Jones, *An Inquiry into the State of Medicine, on the Principles of Inductive Philosophy* (Edinburgh: C. Elliot, 1781), 270.

39. Ibid., 371.

40. Ibid.; *Evidence . . . Edinburgh*, 259.

41. Jones, *Inquiry*, 371.

42. "Minutes of the Medical Faculty of the University of Pennsylvania, 1800–1811," April 7, 1809, 113, University of Pennsylvania Archives, MS 1475.

43. "Medical Graduates, 1814–1850, Dean Horner's Record Book," March 28, 1820, 50, University of Pennsylvania Archives, MS 1574.

44. Ibid., March 21, 1821, 53.

45. Ibid., Feb. 16, 1824, 103.

46. Becker and Geer, "Student Culture," 70.

47. Christison, "Memorial," 8.

Lisa Rosner received a Ph.D. in the History of Science from Johns Hopkins University and is currently Associate Professor of History at the Richard Stockton College of New Jersey. She is the author of* Medical Education in the Age of Improvement: Edinburgh Students and Apprentices, 1760–1826 *(1991) as well as other articles on the history of medical education and practice. She is currently working on a case study of the emerging professionalization of medicine in the early nineteenth century.

Students at the Bedside in German Universities, 1770–1830

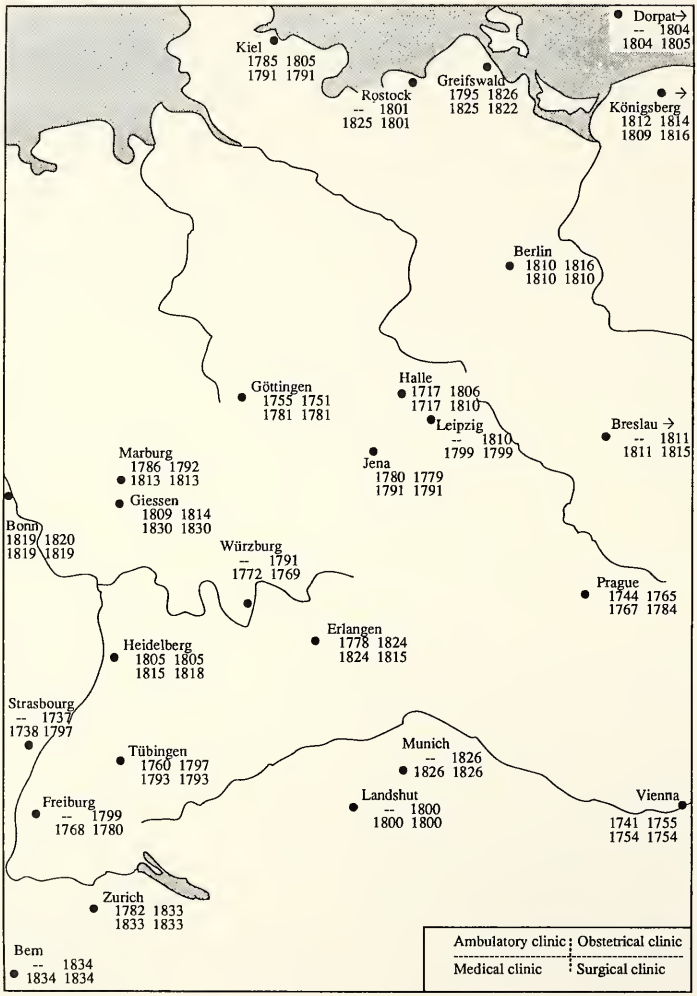
Exhausted by endless hours spent in the lecture hall and in the tedious study of books, a medical student at the Bavarian Provincial University in Ingolstadt complained in 1773 of the lack of practical training: "No clinic, no lying-in hospital. It is always a big 'event,' when a medical student in his third year of studying is allowed to visit a patient in a military hospital."[1] His complaint was echoed by an administrator at the Baltic University in Kiel, six hundred miles to the north: "There is no institution here, neither a hospital nor a lying-in department in which a physician could be trained, thus there will never be any hope of advancement for medical studies."[2]

The situation was not as gloomy for medical students in other parts of the country. At Strasbourg, Goethe recalled of his time of study in the early 1770s that he and other students regularly visited the municipal hospital of that city. "The great serenity and ease shown by our venerated teacher, when leading us from bed to bed," he wrote, "his precise recognition of important symptoms, his assessment of the evolution of the illness, the fine Hippocratic procedure by which . . . knowledge evolves from one's own experience, and not from theory, his closing remarks which were the highlights of his lectures, all this drew me to him."[3]

While these student observations do not constitute a representative picture of bedside teaching, they do show that in the years around 1770 an important shift in the teaching of medical students was taking place. Prior to that time, the education of the would-be physician focused almost exclusively on theoretical knowledge.

Practical learning in the university had been growing in importance for some time—especially in the many anatomical theaters, botanical gardens, and new chemical "laboratories"—but did not extend to the traditional courses in medicine itself. The contrast between these newer approaches and the formal, classroom-centered study of medicine was becoming clear to some students. Many, like the young man in Ingolstadt, were impatient to see and actually learn at the bedside. The faculties at Heidelberg and Tübingen had experimented in the early 1740s with the idea of using patients for instruction, but those efforts had been largely unsuccessful.[4]

by Axel Karenberg



Establishment of ambulatory clinics, obstetrical clinics, medical clinics, and surgical clinics at German universities from 1770 to 1830

German Universities, 1770–1830

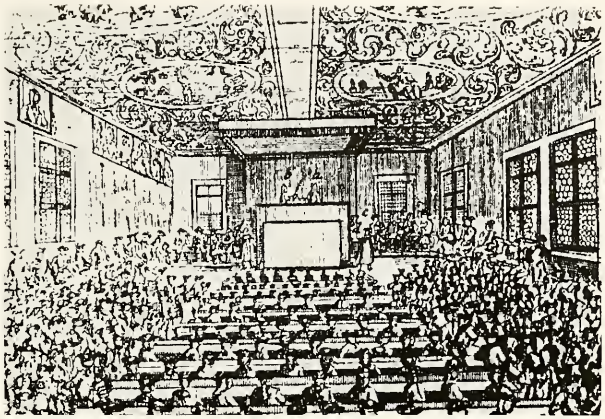
Changing boundaries among German states between 1770 and 1830 make national distinctions almost impossible. For purposes of this study, "German universities" are considered to be those where classes were conducted in the German language, along with the traditional Latin. Thus, "German universities" include institutions in Prussia, in the German-speaking areas of the Hapsburg monarchy and of Switzerland, and in the German states and principalities, as well as certain universities under foreign administration (e.g., Kiel under Danish administration and Greifswald under Swedish administration) and some located outside German territory (e.g., Dorpat in Russia and Strasbourg in France before 1789).

Trends in Clinical Training

A number of factors were important in the German transformation to bedside or clinical training of students after 1770:

1. The growth of utilitarian expectations in German pedagogy and their influence on medical teaching;
2. The general transformation of higher education in Germany, especially the change in the status of universities during the Enlightenment from medieval, privileged corporations to more modern educational institutions;
3. The economic theories of cameralism, which aimed to stabilize public finances by means of a growing population (*Peuplierungspolitik*);
4. A new conception of health policy in which an enlightened state might intervene in health matters and regulate the education of physicians and other practitioners (medical police); and
5. The transformation of the traditional hospital to a modern institution of assistance and treatment for the ill.

Among the groups playing a role in that transformation—sometimes positively, sometimes obstructively—were ruling sovereigns and their medical officers, university professors, hospital administrators, general practitioners, and, of course, medical students. The reason why the history of medicine has taken so little notice of the last group lies in the fact that medical students around 1800, at least in Germany, left nearly no notes, diaries, or letters. It is thus difficult to retrace the changes in medical training from the perspective of individual students, but it is possible to focus a study on students as a whole.[5]



An eighteenth-century lecture in the* auditorium maximum *of Halle

TABLE 1

Growth of Clinics at German Universities, 1770-1830

Year	Ambulatory Clinics	Medical Clinics	Surgical Clinics	Obstetrical Clinics
Before 1770	4	2	2	3
1771—1780	6	5	3	5
1781—1790	8	6	8	5
1791—1800	9	12	13	11
1801—1810	12	15	16	16
1811—1820	14	20	22	21
1821—1830		25	25	24

The following four questions will be investigated in this paper: Where could students do practical work between 1770 and 1830? What were the elements of clinical teaching? How were the daily duties and rights of students regulated? In what kind of setting did early bedside teaching take place? Before turning to those questions, however, we should become acquainted with the basic factors that determined the course of medical education in Germany.

The Institutional Framework

Bedside teaching in western Europe can be dated to approximately 1700. Independently, but at nearly the same time, the pietistic city of Halle and the Calvinistic University of Leiden in the Netherlands began offering regular teaching at the bedside.[6] In Strasbourg, too, practical lessons began well before 1750.

The pedagogic models tested in those cities were adopted and modified by

more than twenty-five academic teaching centers in German-speaking countries between 1770 and 1830. The number of clinical training sites at those universities rose from ten in 1770 to seventy-four in 1830. Most were founded between 1790 and 1820 (Table 1).

Although each university developed unique features, it is possible to describe the complicated process of the institutionalization of bedside teaching by means of a three-phase-model: ambulatory clinics, hospital clinics, and university clinics.

Ambulatory Clinics

In the beginning, small ambulatory clinics (or *Poliklinikeη*) were the favorite teaching sites. At those centers, students gathered at the private residences of professors, where they examined the indigent sick. Thus, medical practice among the poor (*Armenpraxis*) became the crystallization point for practical medical education. The *Poliklinikeη* served a variety of social purposes. In the small university cities of central and northern Germany, in particular, there were no hospitals suitable for clinical teaching. But even in the larger cities of southern Germany, where the Catholic tradition of charity had given rise to large hospitals, administrators normally refused to admit students. Local physicians also resisted competition from students. Important as those reasons were, however, even more compelling was the low cost of the *Poliklinikeη*, where students performed many of the duties and even paid for the medicines used by their patients.

The title page of Frederik Dekkers's 1673 text* Exercitationes Medicae Practicae *featured medical students practicing among the poor.

Hospital Clinics

The growing influence of the state gave rise to two new types of clinical teaching. In the Hapsburg monarchy and southern Germany, the combination of absolutism and Enlightenment produced large general hospitals where, for the first time, teaching wards were established. Such hospital clinics, usually containing no more than a dozen beds, were found in Vienna, Würzburg, and Prague.

Detail of a thesis title page showing three scenes of graduation: the examination, defense of the thesis, and receiving the degree

In the Protestant North, on the other hand, where there was less interference by government, some medical schools established their own university clinics. On the model of Halle, students could take part in bedside teaching. In ideal situations, the university, in addition to a polyclinic, was able to establish or have access to a clinic with beds for medicine, surgical, and obstetrical cases. Such establishments, often primitively housed, proved pedagogically to be very successful. Examples of the first institutions of this kind were in Kiel (1791), Tübingen (1793), Marburg (1813), and Rostock (1826).

University Clinics

The third phase, during the mid-nineteenth century, might be called the expansionary stage. Universities remodeled existing structures for use as teaching clinics or erected new buildings for that purpose. Large, multi-faceted clinics on the base of early foundations became characteristic of German medicine.

The Göttingen Ambulatory Clinic

A good example of the first phase of clinical development, with all its limitations, is found in the university at Göttingen. Established in 1737, following the unification of the Hannoverian crown with that of England, the university became a stronghold of enlightened monarchism. From its very beginning, planning centered on efforts to introduce practice-oriented teaching. The court physician, Paul Gottlieb Werlhof, laid out the essentials for educating a student to become a first-class practitioner of medicine. Apart from botany, chemistry, and "theoria medica," he advised special attention to acquiring practical experience in treating the sick. Werlhof recommended that the university follow the example of neighboring Halle in establishing an "Academic Hospital." After the appointment to the faculty of Albrecht von Haller, a disciple of Herman Boerhaave and one of the most prestigious physicians of the eighteenth century, Göttingen was expected to be a pioneer in Germany in bringing students to the bedside. But Haller was never able to carry out his ambitious plans to inaugurate a clinic, nor was he immediately successful in building a teaching hospital.[7]

Some of Haller's colleagues, nevertheless, tried to impart bedside training to their students. Rudolph Augustin Vogel, for example, established a private ambulatory clinic in 1758. There, every Wednesday and Saturday, the indigent ill from the city and its surroundings underwent a one-hour examination in the presence of students. The bedridden poor were visited at home by Vogel and his followers. Students were assigned a definite number of patients, on whom they had to keep a diary. Occasionally, the teacher and his pupils made a trip to the countryside in order to see the "interesting sick."[8]

From 1773 to 1782 the ambulatory clinic at Göttingen was led by Ernst Gottfried Baldinger, one of the most influential clinical teachers of the century. In his lessons, which normally took place at his home, the weekly program was divided into five sessions. Those held on Monday, Wednesday, and Friday

were reserved for the examination of the ill, while those on Tuesday and Thursday were given over to theoretical lectures. Baldinger encouraged a high degree of self-motivation in his students. He made them examine, give advice, and prescribe, confining himself only to "supervising." Baldinger wrote: "If I should degrade the students to simple 'spectators,' and 'auditors,' the most beneficial purpose of the institute would be lost, i.e., the graduation of carefully educated physicians."[9]

Few studies deal with the reaction of students to the new style of instruction. At Göttingen, the evidence indicates that during the decade from 1773 to 1782, when class size averaged seventy-six students per semester, fewer than a dozen (about 15 percent) attended polyclinical lessons over the entire period of five months.[10] By the turn of the century, that proportion fell to fewer than 5 percent. At other universities, there were comparable results. One can only speculate on the reasons for the apparent lack of student interest. For one thing, the required theoretical lectures took up an inordinate amount of time, while clinical lessons were usually optional; many students stayed away simply in the interest of saving time. As students in all ages, they tended to concentrate on subjects that were required for examinations and licensing.

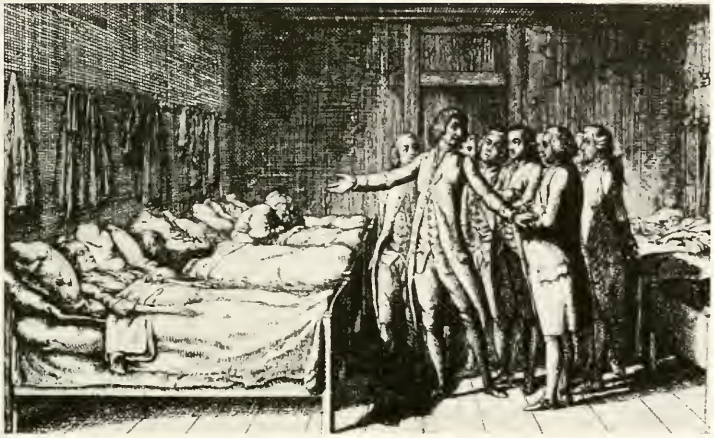
But the long-term effect of the ambulatory clinic at Göttingen should not be measured by numbers alone. More significant was the fact that many students of Baldinger and his successors began to propagate the new pedagogy in other places, and to establish similar institutions at other universities. Among those students were Justus Loder at Jena (1778), Johannes Rahn at Zürich (1782), Georg Weber at Kiel (1791), and Christian Michaelis at Marburg (1813).

Student Experiences at Würzburg

What did the practical lessons of the bedside, the operating theater, and the obstetrical chair actually look like? The university at Würzburg provides a good example.

A Catholic cathedral town on the River Main, Würzburg housed not only one of the oldest medical departments in Germany (dating back to 1582) but also the *Juliushospital* (founded in 1585), one of the largest institutions of its kind north of the Alps. From the 1770s on, the chief physician and the chief surgeon of the *Juliushospital* served as professors for Medical Practice and Surgery, respectively, at the university. That arrangement made it possible for Würzburg students to be instructed at the bedside. A reconstruction of the southern wing of the hospital in 1791 offered an opportunity to establish two rooms with twelve beds each as medical and surgical clinics. Thus, for the first time, a small number of teaching beds was under the direct control of professors. Later that year, with the inauguration of an obstetrical clinic at another site, the typical "triple constellation" of basic medical subjects (Internal Medicine, Surgery, and Obstetrics) was perfected.

A report in 1798 by Joseph Nikolaus Thomann, professor of Internal Medicine at Würzburg, gives a good idea of the kind of bedside teaching available to

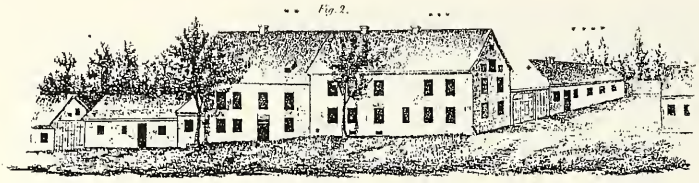


Students at the bedside—clinical rounds at the Charité Hospital, Berlin, in 1783

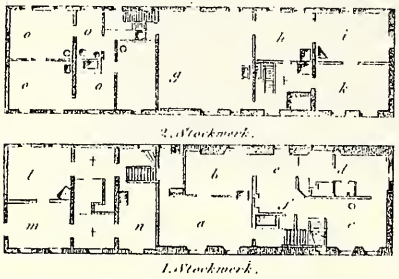
students. Thomann's entire clinical teaching was aimed at providing students with direct experiences. "The study of medicine is perfectly based," he wrote, "upon the knowledge and observation of nature. A complete understanding of it is never possible by means of book studies. . . . The young medical student must be able to take responsibility. Everyone is obliged to look after his patients himself . . . for he alone, under the simple supervision of the chief physician, will be responsible for the salvation of the sick."[11]

In order to achieve the best result, Thomann divided his students into three groups. First came the beginners (*Auskultanten*), who were allowed only to look, listen, and ask questions at the bedside. After six months they entered the second group of "practicing students" (*Praktikanten*), who had actual responsibility for individual patients. "The patients are assigned to these [students] who are in charge of the practical matters of the institution," Thomann said, "and the treatment of the sick is [their] duty under the supervision of their preceptor."[12] On every bed hung a blackboard that showed not only the name of the patient but also that of the student in charge. A small group of experienced students (*Sekretäre*) had additional minor administrative tasks and some responsibility for teaching younger colleagues.

Thomann came to the teaching ward of the hospital each morning at 9:00. He called first on the responsible *Praktikant* to describe the history of any new patient—"not only the symptoms of the illness . . . but also the patient's entire biography including status, age, profession." If possible, the student was to



The first surgical clinic in Königsberg, established in a remodeled farmhouse in 1816



name the origin of the illness, make a diagnosis and prognosis, propose a therapy, and prepare an appropriate prescription. After a thorough discussion with his teacher and fellow students (which sometimes became a heated debate), the student would write up "the case history, the further evolution of the illness, as well as the diagnosis, prognosis, and regimen." At any given moment, those notes were subject to a general examination, and therefore even after discharge or death there existed "a complete record of the entire course of the disease."[13]

Thomann used the clinic to acquaint his students with the symptoms of "all kinds of diseases, and ailments, including those of age, youth, jobs, hysteria, madness, melancholy, epilepsy, skin eruption, and syphilis." That combination of a broad spectrum of "interesting cases," with only a small number of teaching beds, served as the pedagogical ideal in Germany for preparing students for the actual practice of medicine. "The students," wrote Thomann, "will see few cases, however, they will learn to see exactly what they need to learn."[14]

Very similar arrangements existed in the other teaching clinics at Würzburg. In the surgical clinic, students not only could examine patients and carry out minor activities but could assist the

teacher during major operations and watch at the bedside the first night following an operation.[15]

The obstetrical clinic also offered a practice-oriented curriculum to prepare the student, step-by-step, for his later job as an accoucheur. Only after considerable practice on a corpse and a model did the student learn the manual examination of a pregnant woman; only later was he allowed to carry out a delivery on his own.[16]

University Clinics

Universities lacking access to a hospital (or the financial means to construct one) established clinics in old buildings remodeled for that purpose. Many early university clinics had their origin in former schools, uninhabited residences, unused factories, empty barracks, or cramped private houses. How those makeshift institutions helped to establish student bedside teaching over many decades can be demonstrated by two examples taken from Prussia.

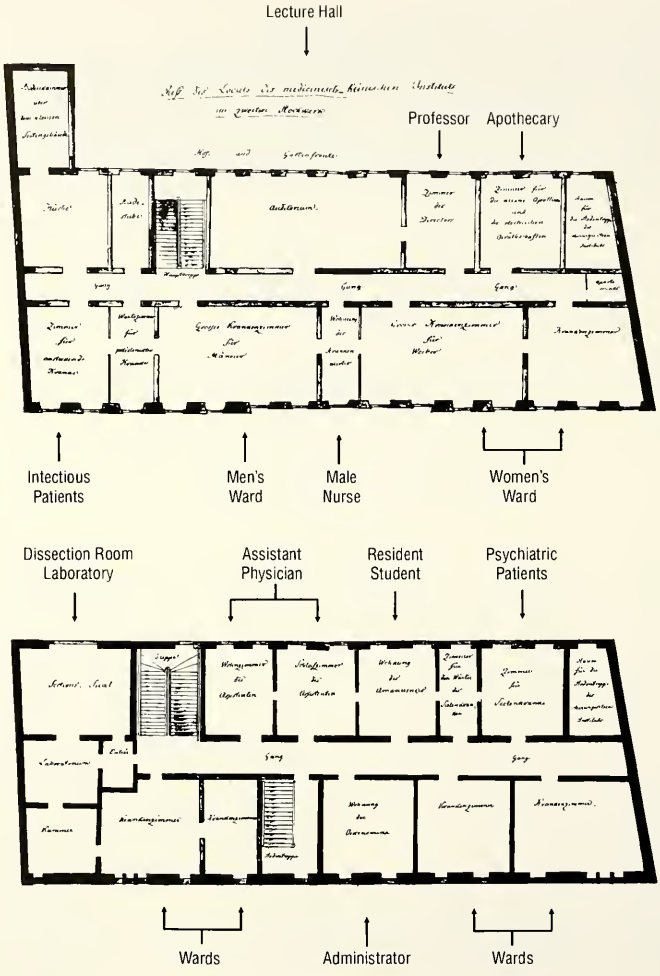
At Königsberg in East Prussia, the first surgical clinic was opened in a farmhouse in 1816. Despite the small amount of space available, its designers separated men from women, as well as surgical patients from those suffering from eye diseases. Moreover, there was enough room to organize a small lecture room, a library, and a "pharmacological cabinet." As was usually the case in those years, the director himself resided in the building.[17]

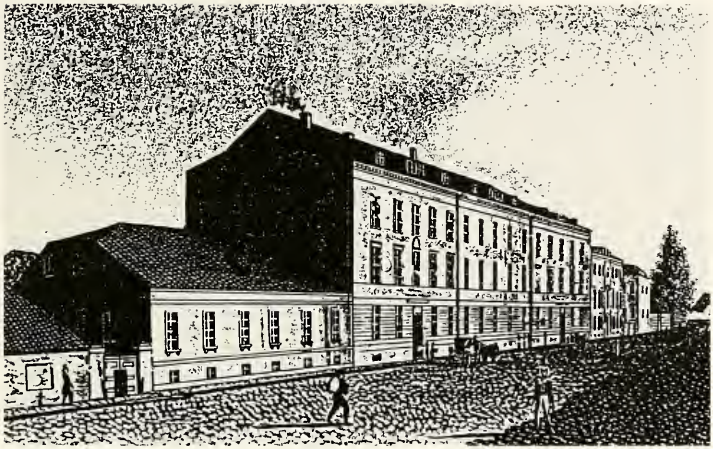
Examples from Berlin demonstrate that the remodeled clinic was not limited to remote provincial universities. Even after the foundation of the University of Berlin in 1810, the large Charité Hospital continued to be reserved mainly for the use of military surgeons, their students, and midwives. University authorities, eager to begin bedside teaching, were compelled to establish their own clinics outside that large institution.[18]

Recently found plans enable us to become acquainted with one of those important university clinics, that in the *Ziegelstrasse*. Formerly a lead acetate factory, the first two floors of the facility were modified to accommodate a surgical clinic, while the medical clinic was housed on the second floor and in the attic. A look at the rooms in the medical clinic shows that, despite the cramped conditions, every effort was made to realize a high degree of functional differentiation. On the second floor, for example, two wards, located south of the middle aisle, were separated by an office for the male nurse. Infectious patients were able to have their own room. The rear of the building housed the apothecary, the director's office, and a lecture hall. The attic showed a similar layout of rooms. Rooms were available for the assistant physician and a resident student. Like other early university clinics, the *Ziegelstrasse* had its own dissection room. A small laboratory, where blood, sputum, and urine were subject to chemical analysis, indicates that laboratory examinations had begun to be incorporated into clinical training.

Conclusion

By the 1830s, practical instruction at the sickbed had become a matter of course at almost all German universities. Simultaneously, the medical faculties


Lecture Hall
Professor
Apothecary
Intectious Patients
Men's Ward
Male Nurse
Women's Ward
Dissection Room Laboratory
Assistant Physician
Resident Student
Psychiatric Patients
Wards
Administrator
Wards



Exterior and interior views of the University Clinic in Berlin, opened in 1818 in what had been a lead acetate factory

The second floor contained the lecture hall, apothecary, and several patient wards.

The attic held the laboratory, the administrator's office, additional wards, and rooms for the resident physician and resident student.

were evolving in two directions—first, a multiplication of clinics in a number of specialties; and second, the founding of new institutes for basic scientific research (including, physiology and pathology). It was exactly that conjunction of lecturing, bedside teaching, and training in the laboratory that eventually produced exemplary educational conditions for a new generation of medical students.

■

Notes

1. As cited in Hermann Kerschensteiner, *Die Geschichte der Münchner Krankenanstalten* (Munich and Berlin: J. F. Lehmanns, 1939), 112.

2. Count Reventlou to the German office in Copenhagen, March 4, 1783, as cited in Heinrich Schipperges, "Geschichte der Medizinischen Fakultät: Die Frühgeschichte, 1665-1965," *Geschichte der Christian-Albrechts-Universität Kiel,* ed. Erich Hofmann, Rudolf Jäger, and F. A. Schmidt-Künsemüller (Kiel: Karl Wacholtz, 1967), vol. 4, pt. 1, 89.

3. As cited in Georges Weill, "Des chirurgiens-barbiers aux 'hommes en blanc': Les études médicales à Strasbourg du 15eme au 20eme siècle," *Saisons d'Alsace* 2 (1951): 185–97.

4. Eberhard Stübler, *Geschichte der Medizinischen Fakultät der Universität Heidelberg* (Heidelberg: Carl Winters Universitätsbuchhandlung, 1926), 123.

5. For the development of clinical instruction outside the walls of the academy, see Ernst Theodor Nauck, "Über die anatomischen, chirurgischen und geburtshilflichen Lehranstalten vornehmlich

ausserhalb der Universitäten im 16.–19. Jahrhundert," *Anatomischer Anzeiger* 113 (1963): 193–213 and 116 (1965): 202–16.

6. The beginning of practical instruction in Halle dates back to 1706. After 1708, policlinical and clinical teaching took place in a small hospital near the world-famous "Orphanage"; see Wolfram Kaiser, Karl-Heinz Krosch, and Werner Piechocki, "Collegium Clinicum Hallense," *Wissenschaftliche Berichte Universität Halle* 3 (1967). The best summary of the development in Leiden is Harm Beukers, "Clinical Teaching in Leiden from Its Beginning until the End of the Eighteenth Century," *Clio Medica* 21 (1987–1988): 139–52.

7. The reasons for the rejection of Haller's plan were not limited to Göttingen, but can be applied to many other places. In the case of Göttingen, government and university were not willing to share the financing of the project. The city feared that such an "Academic Hospital" would disturb the public order, and the town physician was afraid of losing his post. See Renate Kumsteller, *Die Anfänge der Medizinischen Poliklinik zu Göttingen* (Göttingen: Häntzschel, 1958), 26.

8. Johann Stephan Pütter, *Versuch Einer Academischen Gelehrten-Geschichte von der George-Augustus-Universität zu Göttingen*, 2 vols. (Göttingen: n.p., 1765–1788), 1:293.

9. Ernst Gottfried Baldinger, "Das göttingische klinische Institut," *Neues Magazin für Ärte* 11 (1789): 97–125.

10. Kumsteller, *Die Anfänge*, 35.

11. Joseph Nikolaus Thomann, *Ueber die Klinische Anstalt an dem Julius-Hospitale zu Würzburg* (Würzburg: Kölische Buchhandlung, 1798), 9–10, 30–31.

12. Ibid., 32.

13. Ibid., 42.

14. Ibid., 12.

15. Johann Barthel von Seibold, *Geschichte und Gegenwärtige Einrichtung des Chirurgischen Clinicums im Julius-Spitale zu Würzburg* (Würzburg: Joseph Stahel, 1814), 68 and his *Vorläufige Nachricht von der Gegenwärtigen Einrichtung des Klinikums an dem Julius-Hospital zu Würzburg* (Würzburg: Riennerische Buchhandlung, 1795).

16. Elias von Siebold, *Über Zweck und Organisation der Klinik in Einer Entbindungsanstalt* (Bamberg and Würzburg: J. A. Göbhardt, 1806), 27–28.

17. Carl Unger, *Nachrichten über das Ärztlich- Wundärztliche und Augenheilkundige Klinikum der Kgl. Universität zu Königsberg* (Königsberg: Universitäts-Buchhandlung, 1823).

18. Paul Diepgen and Paul Rostock, eds., *Das Universitätsklinikum in Berlin* (Berlin: J. A. Barth, 1939), 22.

Axel Karenberg is a research and teaching fellow in the Department for the History of Medicine at Cologne University. He completed his M.D. in Cologne in 1985, with a subsequent specialization in psychiatry in 1989 before starting his historical studies. His current projects include a study of the institutionalization of bedside teaching in Germany between 1760 and 1840. His research activities, including a one-year stay in the Department of Medical Humanities at the University of California at Los Angeles, have been generously supported by the Deutsche Forschungsgemeinschaft.

"Without Compromising in Any Particular": The Success of Medical Coeducation in Cleveland, 1850–1856

On March 4, 1852, the *Daily True Democrat* of Cleveland, Ohio, reported that the commencement exercises of Cleveland Medical College (CMC), the medical department of Western Reserve College, had taken place the preceding day in a lecture room at the College. The fifty-three members of the graduating class were unremarkable except for a single candidate—Nancy Talbot Clark of Sharon, Massachusetts, the first woman at Western Reserve and the second woman ever to receive a medical degree in a coeducational setting from a recognized regular medical school.[1]

The newspaper report of the event took special care to point out that, during the two required sessions of study, Mrs. Clark had "won a good reputation among our citizens as a lady of talent and character as she has with her class and professors for great industry as a student. She has demonstrated the fact that a woman may get a medical education in any of the colleges without compromising in any particular those delicate feelings which constitute the beauty of the sex." Despite her achievement, however, "the professors of this college have deemed it advisable to exclude ladies from their classes in future."[2]

For a young person aspiring to become a doctor in the middle of the nineteenth century, attendance at lectures at a medical school like CMC was an asset, not a requirement, for the practice of medicine. For many, three years of apprenticeship to a licensed physician was all that was needed for acceptance into the profession, but a formal medical education and especially a degree could prove to be commercially beneficial. Among prominent physicians, an apprenticeship by itself was held to be insufficient to instill a "proper demeanor and bearing" that would command professional respect. With a medical degree, a young doctor held a "warrant of authority" that gave him important advantages.[3]

For a woman like Clark, facing seemingly insurmountable barriers in her quest to become a practicing physician, a medical degree from a recognized, regular medical school was a special

by Linda Lehmann Goldstein

Cleveland Medical College, where, under the tutelage of Dr. John Delamater, six women were admitted to study medicine between 1850 and 1855

advantage in attaining what Elizabeth Blackwell would later call "legal status"; it was a means of claiming professional competence without a "taint" of sectarianism or questionable training.

Women Pioneers

This paper presents a survey of the events surrounding the medical education of Nancy Talbot Clark and five other women who were able to enter and to graduate from CMC in the 1850s. By fact and by circumstance, these unusual women demonstrated that the earlier graduation of Elizabeth Blackwell from Geneva Medical Institute of New York in 1849 had been more than a notable exception, a joke, or a fluke. Without compromising their feminine natures or their determination to gain full status as practitioners, this small group of women managed to study medicine and win degrees on an equal basis with male students at a time when no other women in America or Europe were able to do so. Though several medical schools exclusively for women had been opened in America by the early 1850s, a small cohort of women pioneers—whom Dr. Mary Putnam Jacobi would later call an "advance guard"—pursued their medical studies within the mainstream of the professional school in Cleveland.[4]

Western Reserve College

The medical department affiliated with Western Reserve College of Cleveland had been established in 1843 by an act of the Ohio legislature. The urgent need for physicians among the pioneer population in the West, particularly in areas that suffered from outbreaks of malaria and cholera, had resulted in the formation of many small medical schools beyond the Allegheny Mountains. Following a faculty dispute at the fledgling Willoughby Medical College east of Cleveland, four of that school's faculty, led by John Delamater, had resigned their positions to form the new medical department affiliated with Western Reserve College. Known locally as Cleveland Medical College, the school prospered from the beginning, accounting in the 1840s for nearly two thirds of the annual enrollment of approximately three hundred students at Western Reserve College.[5]

Women, of course, were initially denied entrance, as they were to all regular medical schools in the United States. Though women had been primary healers and caregivers since colonial times, they were largely excluded from even the practice of midwifery by the middle of the nineteenth century. In an era of Victorian modesty, reformers pleaded for the return of women healers in order to improve the conditions of childbirth and women's health generally. Some women, seeing no alternative, had entered medical practice as unlicensed healers or had sought degrees from sectarian schools.

The Influence of Elizabeth Blackwell

Elizabeth Blackwell recognized that a number of women wanted to extend their career options beyond the limited range of teaching elementary school in their youth, followed by marriage and maternity. In her view, women were predisposed by nature to assume the healing and nurturing role of the physician. The

practice of medicine, she was convinced, was the most likely and logical direction in which to expand women's sphere of productive activity. In addition, she believed strongly in the benefit of having women practitioners provide health care to their own gender. But women could never overcome the barriers to practicing medicine without greater access to education. Opportunity and acceptance in the professions, she counseled, would come only through formal professional education.[6] Looking back on her early efforts, she later wrote: "It was to my mind a moral crusade on which I had entered, a course of justice and common sense, and it must be pursued in the light of day, and with public sanction, in order to accomplish its end."[7]

Quietly overcoming her own aversion to the sight of blood and disease, Blackwell committed herself to becoming a fully educated doctor. After long years of rejection and disappointments, she succeeded in matriculating at Geneva Medical Institute in 1847, graduated with a medical degree in 1849, and then gained two years of clinical experience in Europe. She thus broke through the barriers to women's entry into regular medicine, established a pathway for others to follow, and became a role model. Thereafter, women would either have to excel, as she had, to compete successfully with men or be forever frustrated, shut off from full participation in the profession.[8] Following Blackwell's lead and, in two cases, through her direct influence, the early women graduates of the Cleveland school reinforced her pioneering effort.

Early Efforts at Coeducation

During the 1850s, as the new Female Medical College of Pennsylvania struggled against ostracism from and harassment by members of the prestigious Philadelphia County Medical Society, the CMC faculty moved hesitantly toward reform, alternately admitting a woman or two, then rejecting others, until a total of six women had been graduated by 1856. No other school in America or Europe with a predominantly male student body achieved so remarkable a record for another decade and a half.

The debate over coeducation in Cleveland was begun in February, 1850, instigated, as in so many schools of the era, by Blackwell's graduation from Geneva Institute. Jared Potter Kirtland, professor of Physical Diagnosis and the Theory and Practice of Physic, a man esteemed nationally for his leadership in the natural sciences as well as in medicine, moved in a faculty meeting that year that "respectable ladies who were fitting for the practice of medicine be admitted to attend all the lectures of the School on the same footing as gentlemen." When a vote was called, Horace Ackley, professor of Surgery, shrewdly burdened the motion by introducing another that asked that "respectable Negroes be admitted to the same privileges," effectively silencing the discussion and tabling both motions.[9]

Nancy Talbot Clark

Later that same year, however, a young widow named Nancy Talbot Clark began studies at the school under the preceptorship of John Delamater,

Two of the Talbot siblings pursued an education in medicine. Nancy Talbot Clark (seated right) was a pioneer woman graduate from Cleveland Medical College in 1852; her younger brother Israel Tisdale Talbot was inspired by her accomplishments to complete studies at the Homeopathic Medical College of Pennsylvania in 1853 and Harvard Medical School in 1854.

dean and professor of Midwifery. There is no clear record of how Clark had been able to enroll at CMC. Like Elizabeth Blackwell, she had been persuaded by a female friend to enter medicine in order to provide medical care, without trauma or embarrassment, to other women. Additionally, she shared a keen interest in science and medicine with a beloved younger brother, Israel Tisdale Talbot. After Clark received her medical degree in Cleveland, the younger Talbot began his medical studies in earnest, graduating in 1853 from the Homeopathic Medical College of Pennsylvania and later earning a degree from Harvard Medical School in 1854.[10]

Although Clark could have attended the medical schools for women in Boston (near the Talbot family homestead) or Philadelphia, she decided instead on Cleveland. The door had been opened to women just a crack during the preceding months. Her appeal apparently found favor with Dean Delamater because of the social ranking of the Talbot family in the Boston area, and possibly because of ties there to the family of his wife.[11] In any case, the records and correspondence of both Delamater and Kirtland show that they were strong advocates of liberal causes, including the abolition of slavery, and neither was opposed to entry of "worthy" women into regular medicine.

Clark's graduation thesis, on the interdependence of the body's vital organs in the pursuit of harmony and balance, showed anatomical and physiological knowledge, focusing on the body's natural healing functions rather than therapeutic intervention.[12] Although many scholars have insisted that women entered medicine in order to give empathic medical care to members of their own sex, the thesis topics chosen by early women students, including Blackwell, displayed a broad range of medical interests and expertise. These women not only met the requirements of the medical education of the era but showed a thoughtful and wide-ranging understanding of the subjects taught. Israel Talbot, present for his sister's graduation, wrote: "Today the diploma of the College was conferred upon her, an honor which she has faithfully earned, for she has been a faithful student, and I am told by the Professors that she stands one of the first, if not the *very first* in medical knowledge in a class of more than fifty graduates. She has won the esteem and respect of all the Professors and students, and many have been the tokens of respect bestowed."[13]

On her return to Boston in 1852, Clark immediately began to practice. She applied for membership in the Massachusetts Medical Society but was abruptly refused. Barred from access to Boston hospitals, she followed the lead of Elizabeth Blackwell and traveled to Europe to obtain clinical experience. After a year of study in Paris she returned to a successful practice in Boston. A romance with Amos Binney, whom she had met on board ship, led to marriage in 1856 and her withdrawal from medicine until her six children had grown. It is, perhaps, her willing acquiescence to contemporary social norms and expectations—including the setting aside of a hard-won and bold professional career for the benefits of marriage—that has led

to the relative obscurity of her accomplishment in the historical accounts of women in medicine.

Following Clark's graduation from CMC, no further mention of women applicants was recorded in faculty minutes until October, 1853. At that time, Kirtland moved that Delamater be empowered "to act at his discretion in the admission of female students—insisting upon proper qualifications—moral character—purpose to complete their education."[14] Apparently uneasy at the growing public support for the training of female practitioners, the faculty unanimously turned the "woman question" over to their dean, who was holding a request from Elizabeth Blackwell to admit her younger sister, Emily.

Emily Blackwell

Emily Blackwell had previously gained entry and completed the 1852–1853 session at Rush Medical College in Chicago, but was then informed that, although she could attend the next session, she would not be allowed to graduate. Returning to New York in the summer of 1853, she obtained permission to attend clinics and rounds at Bellevue Hospital, an exceptional experience for an American woman during the time. Elizabeth had already told Emily that "the possibilities of study in Eng[land] are not what [she] hoped" and advised her to persevere in America. In regard to the Female College of Pennsylvania, Emily shared her sister's opinion that "this stupid Philadelphia college may make it difficult for me to enter any College here, but what has been done [i.e., earning a medical degree on an equal basis with men] may be done again."[15]

Delamater admitted Emily to CMC in November, 1853. Drawing on case examples from her experience at Bellevue, Emily composed a strong thesis that urged caution in the free use of medications. She was outraged by the harsh, system-specific therapeutics of the past and called for a means of classification of all individual remedies. When physicians reached the point that they could administer medicine in dosages with confidence of the result, Emily argued, "then, and not until then, all uncertainty will cease and medicine will take its true position, that of an exact science."[16]

Community Support

The favorable climate for women at the local medical school drew the attention of the citizens of Cleveland, among whom such reform issues as women's rights and abolition of slavery were being hotly debated. A steady influx of speakers from the East were drawing large, enthusiastic audiences on the lecture circuit. Many Cleveland women had attended the Women's Rights Conference of 1850 in Salem, Ohio, and more were at Akron in 1851 to hear Sojourner Truth speak. At the 1852 conference in Massilon, Ohio, Caroline Severance and Martha J. Tilden of Cleveland were elected officers.[17] Later that year Severance and Tilden joined with eight other wives of prominent Cleveland business leaders and politicians to form the Ohio Female Medical Education Society, an association organized for the encouragement of medical education for women.

The purpose of the society, according to its constitution, was to provide loans to deserving women for the expenses incurred by the study of medicine. As stated in Article IV, a "worthy" applicant was one who could "furnish testimonials of a past upright life, a good rudimental *[sic]* education, and a sufficiently robust constitution and freedom from actual disease, to endure the course of study, and furnish reasonable ground of hope that the aid given will ever be profitably employed." The Ohio Female Medical Education Society was one of the first medical student aid funds established for women by women. The terms of the agreement were very liberal. The recipient was obliged to pledge that repayment of the loan would be made when she became sufficiently established in her practice or otherwise financially comfortable enough to repay the sum loaned, at no interest.[18]

Assisted by Harriot Kezia Hunt of Boston, a well-known practitioner and popular circuit lecturer, the Female Medical Education Society formed eight chapters throughout Ohio over the next three years.[19]

Meanwhile, Emily Blackwell, following her graduation in 1854, set off for Europe. There she obtained invaluable clinical experiences in Edinburgh (with Sir James Simpson), in Dresden (with Dr. Franz von Winckel), and throughout London, Paris, and Berlin.[20] When she returned to New York in 1856 to assist Elizabeth in establishing the New York Infirmary for Women, she was the most highly trained woman physician in America.

Marie Zakrzewska gave up her position as chief of the School for Midwives at the University of Berlin because she had heard that women could earn a "proper" medical degree in the United States.

Marie Zakrzewska

While Emily studied in Europe, Elizabeth had been grooming Marie Zakrzewska, a young émigré midwife from Prussia, to join the physician-sisters as a colleague.[21] Under the mentorship of Joseph Schmidt, professor of midwifery at the University of Berlin, Zakrzewska had been an outstanding

student who rose quickly to the position of chief of the School for Midwives. She was frustrated, though, by the exclusion of women from full participation in the profession. Hearing of the establishment of the Female Medical College of Pennsylvania at Philadelphia, she assumed that attitudes were different in America. She emigrated with hopes of earning a "proper" medical degree and establishing her own hospital for women. Upon reaching New York City, however, she was handicapped by her lack of fluency in English and disappointed at the less-than-enthusiastic support for "female doctresses." She found no one who was familiar with the Philadelphia school, while those few who had heard of women physicians at all thought the idea odd. Nonetheless, she eventually found the Blackwells and the New York Infirmary for Women.

From the first, Elizabeth Blackwell recognized Zakrzewska's great talents and skills, and set about assuming the role of preceptor. Blackwell taught her rudimentary English, and petitioned Delamater once again to enroll a female student at CMC. Blackwell had also become aware of the Ohio Female Medical Education Society through her involvement with similar reform groups. When Delamater indicated that Zakrzewska could come to Cleveland for the fall session of 1854, arrangements were made with the Female Education Society for a loan. Also, boarding was secured with Caroline Severance, the wife of a prominent businessman, whose home was a popular gathering place for reformers and visiting lecturers. Later, Zakrzewska worked as a nursemaid for a minister's family and moved to a neighborhood boarding home, which, though reluctantly, housed several female medical students.

While Zakrzewska claims in her autobiography that she did not acquire enough facility in English to follow lectures until her second session at CMC, she did manage to complete her studies, failing in only one subject. Professor Kirtland had been in correspondence with her mentors in Berlin, however, who had praised her so highly that her difficulties in America were rightly considered to be the result of her faulty English. Zakrzewska received so much assistance from Delamater that she listed him as her preceptor during her second term. She went to his home twice a week to recite her lessons and, in addition, was given "much practical advantage" in her work in obstetrics. Thus, Zakrzewska was apparently allowed to assist—or at least observe—obstetric cases during her formal education, a unique advantage for female students. (Males who lacked a medical degree, including medical students, were prohibited by law from observing a birth; as students they learned obstetrics only through lectures, graphics, and practice on mannequins.)

For graduation in 1856, Zakrzewska completed a thesis on the physiology of the uterus at parturition.[22] The essay was well received by faculty, and any question of her abilities was finally dismissed.

Sarah Ann Chadwick

One month after Zakrzewska arrived in Cleveland, another woman was accepted at CMC for the fall session of 1854. Although frequently referred to as

"Mrs. Chadwick," she was born Sarah Ann Chadwick in Windsor, Maine, and lived most of her life with her family on the edge of the frontier in the small farming village of Lee Center, Illinois.[23] Like Zakrzewska, Chadwick received financial assistance from the Ohio Female Medical Education Society. She became Zakrzewska's roommate in the boarding house near the college, but the two were different in temperament. Zakrzewska, who sought out all facets of the community, found her quiet roommate withdrawn and prudish.[24] Chadwick completed a thesis on the inevitability of contagion and received her degree in 1856.[25]

At the opening of the CMC session in November, 1855, Zakrzewska and Chadwick were joined by two more female classmates, Cordelia Agnes Greene and Elizabeth Griselle, both of whom had completed a first session at the Female Medical College of Pennsylvania.

Elizabeth Griselle

Elizabeth Griselle, who came from Salem, Ohio, had been raised in an atmosphere of reform and social action. Her Quaker family were fervent abolitionists.[26] Her mother's name appears in the reports of the Women's Rights Convention held at Salem in 1850. Also active at the Ohio conventions of the early 1850s was Kelsey Thomas, an instructor at the Female Medical College of Pennsylvania, whom Griselle named as her preceptor when she enrolled for a second session at CMC. Thomas, an Ohioan, strongly supported the entry of women into medicine and acted as their preceptor.[27] It was Thomas who advised Griselle to complete her degree in Cleveland since she intended to practice in Ohio. (She was the only one of the women graduates who practiced in the state.) Her thesis on the biochemistry of ingestion and excretion in 1856 showed

Elizabeth Griselle titled her 1856 graduation paper "A Thesis on the Relation of Chemical Forces to Vitality," an examination of the biochemistry of ingestion and excretion.

her familiarity with the literature and a broad understanding of the physiology of the human system.[28]

Cordelia Greene

Cordelia Greene, the sixth and final woman to graduate from CMC during the 1850s, had served many years as assistant to her father, Dr. Jabez Greene, a prominent hydropathist in western New York. When she sought medical training, she was able to obtain entry into the women's school in Philadelphia, earning enough money for her expenses through nursing. Then, through the efforts of Dr. Henry Foster of Clifton Springs Water Cure, a family friend, she was hired by the Cleveland Water Cure Spa, headed by Dr. T. T. Seelye, while at the same time completing her studies toward a regular medical degree at CMC.[29] That the CMC faculty did not object to Greene's sectarian ties implies that Seelye's establishment had emerged as a significant force in the community, perhaps because he, like Jabez Greene, held a regular medical degree.

Seelye and Jabez Greene, both avowed hydropathists, are listed as Cordelia Greene's preceptors in the class records. Not retreating from her sectarian therapeutics, Greene wrote a thesis outlining the social causes of disease and the preventive approaches she believed would eliminate them. She bowed to traditional doctrines only by suggesting that general principles of medicine might be improved by the "conjoint influence of preventive measures."[30]

Campus Life

Although so large a contingent of women was seen as an oddity in many corners of the community—and met some resistance from male students—the four women medical students provided each other with support and companionship. They often studied and read together. According to Zakrzewska, "There being four women among a couple of hundred young men, we had a box seat to ourselves, unmolested by the tobacco-chewing and spitting Aesculapians in embryo."[31]

After the 1856 graduation, the CMC doors were again closed to women until well after the Civil War.[32] Delamater and Kirtland, the women's strongest advocates, were growing old and nearing retirement. A new regime with different attitudes was about to assume leadership. Delamater conceded that, with the increasing stability of the Female Medical College of Pennsylvania, women need not hesitate in seeking a regular degree in medicine from that institution.[33] No other woman would receive a degree from a regular coeducational medical college in the United States for the next thirteen years, when Estelle Rorick graduated from the University of Michigan in 1869.[34]

Careers of the Pioneers

Four of the six CMC graduates did not marry—Blackwell, Greene, Griselle, and Zakrzewska. They provided each other with continuing support—friendly and financial—throughout their lives.

Each adopted at least one child on whom to bestow maternal affections. (The mysterious Chadwick apparently did not maintain contact with her female colleagues.) Five of the graduates were members of the American Medical Association at the time of their deaths. Three of them seized opportunities to provide leadership in the education of aspiring women physicians.

Cordelia Greene, after earning her medical degree, joined the staff of the water cure spa at Clifton Springs. Upon the death of her father in 1862, she returned to Castile, New York, bought his spa, and maintained a busy practice there until retirement. Her grateful patients, who included Susan B. Anthony and Frances Willard, sometimes referred to her as "Saint Cordelia." The personalized, practical treatment and cure obtained by patients at Castile—prayers, hugs, cold water baths, and no traditional harsh remedies—bordered on a semi-religious experience for many. She also oversaw the practical apprenticeship of young women at the Castile Spa for more than forty years before spurring them on to more formal medical education. After Greene's death, the Castile Sanitarium passed to her niece, Dr. Mary Greene, an 1890 graduate of the University of Michigan School of Medicine.[35]

Marie Zakrzewska, after her association with the Blackwells at the New York Infirmary, founded the New England Hospital for Women and Children in Boston, providing a haven where women medical graduates could obtain practical clinical training without traveling to Europe. She also joined the faculty of the New England Female Medical College. With that income she was prepared to repay the loan of two hundred dollars extended by the Ohio Female Medical Education Society. But the Society had long since dissolved, and there was no place to which to return the money. Feeling an obligation to those who had helped her accomplish her quest in America, Zakrzewska loaned the money to other needy women medical students, under the same terms that she had received help. When an amount was paid back, she loaned it again, continuing throughout her life to assist other women to enter the profession of medicine. Many women who later assumed leadership roles in the profession served internships at the New England Hospital under Zakrzewska's guidance, including Susan Dimock, Elizabeth Mosher, Mary Putnam Jacobi, and Kate Hurd-Mead. In 1863, Zakrzewska added a formal training program for nurses.[36] She retired from practice and hospital responsibilities in 1899.[37]

Griselle, except for a brief period of practice in Cleveland following her graduation and a sojourn in San Francisco in the 1870s at the height of the westward migration, enjoyed a long, steady medical practice in her hometown of Salem, Ohio.[38]

No record of Sarah Ann Chadwick's work immediately after graduation has been uncovered. The *Congressional Record* does reveal, however, that in 1861 she volunteered to serve as a Surgeon with the Seventh Illinois Volunteer Cavalry at the outbreak of the Civil War, as the western states were called upon to hold Cairo, Illinois, for the Union. Her services were so commended by the

troops that she was allowed to continue, but because of her sex she could not be given the rank of Surgeon. She was nonetheless subsequently paid by the Congress for her service as an Assistant Surgeon, one of the very few medically-trained women who was not forced to assume the veneer of nurse.[39] She was married after the war, which may have been responsible for her subsequent retirement from medicine.

The Other Blackwell

In historical accounts, Emily Blackwell's career has frequently been overshadowed by the prominence of her sister's achievement in graduating as the first formally-trained woman doctor. But, in fact, Emily was the steady hand shaping the Women's Medical College of the New York Infirmary from its beginning in 1868 until its merger with the newly coeducational Cornell Medical College in 1899. When Elizabeth Blackwell left New York for Great Britain in 1869, Emily assumed the responsibilities of dean, and taught the course in diseases of women and children. She served in those capacities throughout the school's existence.

When she helped launch the Infirmary School in New York in 1864, Emily charged that "there is not in the whole extent of our country, a single medical school where women can obtain a good medical education."[40] At the time of the school's closing, she underscored that "the friends who established, and have supported, the Infirmary and its College have always regarded coeducation as the final stage in the medical education of women."[41] In the interim, the Women's Medical College of the New York Infirmary had introduced standards and innovations that helped ensure that its students procured as good an education as any in the country. Those included formal entrance examinations, an obligatory three-year curriculum with graded (sequenced) courses, and the establishment of a board of examiners made up of professors from other New York colleges.[42] Over the course of thirty-one years, the Women's Medical College of the New York Infirmary graduated 364 women physicians.

Conclusion

By their great success and diversity of careers, the first six women graduates in medicine of Western Reserve College demonstrated uncompromisingly the capacity of women to undertake the strenuous demands of medical education with men and to perform competently in their chosen profession. Through them, the entry of women into the formal study of medicine, the necessary prerequisite to acceptance as practitioners, was fulfilled.

■

Notes

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Linda Lehmann Goldstein is Director of Corporate and Foundation Relations and a Research Associate in the American Studies Program at Colby College, Waterville, Maine, where she teaches a popular course on the history of women in medicine. Her graduate work was done in the American Studies Program at Case Western Reserve University, where she authored several articles on the first women graduates of the Cleveland Medical College. In 1987 she was the M. Louise Carpenter Gloeckner, M.D., Research Fellow at the Medical College of Pennsylvania in Philadelphia.

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